Working Paper No. 7

THE IMPACT OF TRADE AND EXCHANGE RATE POLICIES ON ECONOMIC INCENTIVES IN BANGLADESH AGRICULTURE

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June 1993

Funded by USAID under Contract No. 388-0027-C-00-9026-00

BIDS-IFPRI AGRICULTURE DIVERSIFICATION PROJECT

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The author is grateful to Mr. A.K.M. Mahbub Morshed and Mr. Imtiaz Ahmed for responding to the daunting challenges of computations imposed on them by me in the course of this study. They provided outstanding research assistance to this project. He is also grateful to Mr. Fariduddin Ahmed for his excellent word processing support.

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Section One

Introduction

1.1 Historical Evolution of the Policies

At inception, Bangladesh was faced with serious foreign and domestic resource imbalance. To overcome the foreign exchange crisis and promote rapid industrialization the country opted to pursue a strategy which placed heavy emphasis on saving foreign exchange. Taxation of imports provided a convenient source of generating large revenues for the public exchequer on the one hand, while providing protection to domestic industries, on the other. Levies on imports, therefore, were used as the main instrument for mobilizing domestic resources to ease the fiscal deficit.

The strategy of restricting imports and exports and providing heavy protection to domestic industries for promoting overall development of the economy fitted well with the nationalist aspirations of successive political regimes upto the early 1980s. Import-substitution, therefore, became the cornerstone of the country's development strategy and has remained so until the recent spate of policy reforms. An excessively high and complex structure of import tariffs, pervasive import controls, export taxes (jute tax upto the late 1970s), export restrictions and fixed and multiple exchange rates characterized the external trade regime. The import control regime and the exchange rate policy permitted the government to maintain an overvalued exchange rate well into the 1980s which imposed an implicit tax on exports and

offset some of the protection provided to import-competing industries. The earnings from exports were channeled into the modern industrial sector through import of capital goods at lower tariff rates complemented by subsidized interest rates. The total industrial sector barely comprised 7% of GDP at the country's inception and presently claims a share of only 10% of GDP.

Owing to protracted balance of payments difficulties, poor overall resource balance, and persistently large fiscal deficits and a highly unsatisfactory overall economic performance, the Government initiated major policy reforms in the early 1980s within the policy framework of the Extended Fund Facility and structural adjustment lending of the IMF and the World Bank. The policy reforms which spanned the entire decade of the 1980s and are continuing, included removal of quantitative restrictions on imports, phased reduction of tariffs, flexible exchange rate policy, withdrawal of subsidies including those on agricultural inputs, i.e., fertilizer, irrigation equipment, etc. The major objectives of the policy reforms have been to neutralize incentives between import substituting and export promoting activities and improving productive and allocative efficiency in the economy to accelerate the pace of overall economic growth.

Restrictionist trade and exchange rate policies can have large indirect effects on agricultural production, investment, growth, employment, and income-distribution through their impact on producer incentives relative to other sectors of the economy. Agricultural pricing policies, e.g., price

support policies constitute direct intervention and are more commonly focussed upon in assessing the impact of economic incentives on agricultural production. Impacts of commodity specific trade policies, e.g. import tariffs or export taxes and QRs on exports and imports of rice, oilseeds, etc., also constitute direct effects. The economywide trade and exchange rate policies, however impact agriculture indirectly. The main indirect effects represent exchange rate misalignment deriving from macroeconomic polices. Such misalignment when present reduces real income of exporters and import-competing producers of agricultural commodities; protection to the industrial sector at the expense of agriculture, which raises the prices of inputs to farmers and consumer price faced by them, change in the relative prices of traded to non-traded goods, i.e., appreciation of the real exchange rate affecting not only the trade balance and the domestic resource balance, but also resulting in additional taxation of the agriculture sector. The effect of these indirect policies on the agriculture sector can be far greater than is commonly realized since many agricultural commodities are actually or potentially tradable goods.

Table 1.1 shows the trading status of Bangladesh with respect to different agricultural commodities in different time periods since 1977/78. Beyond 1987/88 data for all the agricultural commodities shown in the table are not available. Wheat, mustard seed, edible oil, sugar, fruits, cotton, and tobacco are clearly importables. Tea, vegetables, and jute fiber are exportables.

Table 1.1

Production, Import, Export and Trade Share of Selected Commodities

Commodities	1977-78 to 1979-80					1985-86 to 1987-88				
	Production	Import	Export	Import[a] Ratio	Export[b] Ratio	Production	Import	Export	Import Ratio	Export Ratio
Cereals										
Rice	32616973	907865	19	0.0278	0.0000	80114893	1661812	0	0.0207	0.0000
Wheat	1383215	2686203	0	1.9420	0.0000	5295609	6755519	0	1.2757	0.0000
Pulses										
Lentils	565200	2087	0	0.0037	0.0000	1660346	86884	0	0.0523	0.0000
Gram	260271	0	128	0.0000	0.0005	777196	8030	139	0.0103	0.0002
Oilseeds										
Mustard	765412	171784	2551	0.2244	0.0033	2241311	603254	0	0.2692	0.0000
Linseed	33909	0	0	0.0000	0.0000	284979	0	0	0.0000	0.0000
Tobacco & Beverages										
Tea	643320	26	590985	0.0000	0.9186	1425637	6	1056456	0.000	0.7410
Tobacco	409733	20338	32	0.0496	0.0001	519334	83207	21150	0.1602	0.0407
Vegetables & Fruits										
Potato	1945616	13665	64	0.0070	0.0000	4442449	614	3983	0.0001	0.0009
Vegetables	818411	0	1787[c]	0.0000	0.0022	1996435	0	43401	0.0000	0.0468
Fruits	228800	88733	60	0.3878	0.0003	711600	377100	3769	0.5299	0.0053
Fibers										
Jute	3716791	0	1951294	0.0000	0.5250	22195359	0	3135051	0.0000	0.1412
Cotton	1472	1254149	2067	851.7979	1.4044	336677	1639257	3075	4.8689	0.0091
Others										
Sugar	1002047	169614	4884	0.1693	0.0049	2453515	878564	0	0.3581	0.0000
Ed.Oil	311237	3329952	0	10.6910	0.0000	947240[d]	4357515	0	4.6000	0.0000

Sources:

(1) Statistical Yearbooks 1974 to 1991; B.B.S.
(2) Foreign Trade Statistics 1976-77 to 1987-88; B.B.S.
(3) Export from Bangladesh 1972-73 to 1988-89; EPB.
(4) World Bank (1984), Bangladesh: Economic Trends & Development Administration; Vol. II.Statistical Appendix; February 27,1984.
(5) World Bank (1990), Bangladesh: Managing the Adjustment Process -- An Appraisal; March 16, 1990.

Notes:

a. Import Ratio = Import/Production.
b. Export Ratio = Export/Production.
c. Since the marketing spread between farmgate price and export price (f.o.b. Dhaka) is very large (see Table 5.2 below) average export values reflect approximate valuation at export parity prices at farmgate. Without this correction the export-production ratio in value terms would be misleading.
d. BBS data on domestic edible oil production are not consistent with data on domestic edible oil seed production plus imports. The data on edible oil production was therefore made consistent with edible oilseed production. The milling conversion factor used was: 1 Kg oilseeds = .323 kg oil. The discrepancy was negligible from 1977/78-1979/80 but, was large for the period 1985/86-1987/88.

But the trading status of rice, which is by far the most important agricultural commodities, pulses, and potato are ambiguous. Bangladesh is self-sufficient in these commodities. But the trading status with respect to these commodities may change from year to year in response to whether induced shifts in production.

1.2 Policy Bias Against Agriculture

The policy bias against agriculture has long historical roots. In the classical models and some of its more modern variants e.g., Lewis (1956) the "squeeze" on agriculture provides the economic surplus which is used to finance development of the modern industrial sector. Direct or implicit taxation, procurement prices which are kept below market prices, provision of food subsidies to the urban sector, etc. are examples of such intentional discrimination against agriculture. In Bangladesh, however, the discrimination appears to have been unintended — a consequence of well-meant policies to insulate agricultural producers against price fluctuations in the world market and a development strategy which emphasized saving foreign exchange through import-substitution. Weak representation of the interests of the peasantry within the major political parties and the predominance of commercial-cum-industrial vested interests not only permitted the excessively protected economic regime but also shaped the political economy of Bangladesh in a manner that permitted the policy regime to continue to discriminate against agriculture for nearly two decades.

Agriculture continues to remain the most important sector in Bangladesh. Though, its share in total GDP has declined to around 40% in 1990/91, it still employs 55% of the total labour force. By far the largest number of absolutely poor people are still located in this sector. Strong real growth of the agriculture sector is crucial for overall economic growth, employment and

alleviation of poverty, and consequently much-needed expansion of the "thin" domestic market. Though agricultural commodities contribute little directly to export earnings, the indirect contribution through jute goods, leather and frozen fish can not be denied. The direct and indirect agricultural exports presently comprise around 52% of total exports. To the extent that which trade and exchange rate policies discriminated against exports, these also discriminated against agriculture. Direct intervention in agricultural output markets (e.g. price supports) have not been particularly significant in Bangladesh especially in comparison to other South Asian countries. By contrast, intervention in the input markets through subsidies to fertilizers, irrigation, etc. was been very significant upto the mid-1980s. Public investment in flood control and drainage programs has also provided large direct government allocations to agriculture.

The present study provides an investigation of the magnitude of direct and indirect effects of sectoral pricing policies and the indirect effects of economywide trade and exchange rate policies on agricultural commodities in Bangladesh. The analysis of incentives will be undertaken in terms of output prices and value-added since input subsidies have been a major form of intervention in agriculture.

Following this introduction Section two discusses the Agricultural Prices Policies in Bangladesh. Section three discusses the trade and commercial policies with their impacts on the manufacturing sector as well as the agriculture sector. Section four presents the analysis of exchange rate. Section five discusses the impact of various policies on the economic incentives of various traded and non-traded agricultural products. Finally, Section six provides with some conclusions.

Section Two

Agricultural Pricing Policies in Bangladesh

2.1 Foodgrains

Upto the early 1980s, i.e. the first decade of its existence Bangladesh designed its foodgrain pricing policy with the objective of providing low and stable prices to consumers. Therefore, procurement prices were below market prices in four out of seven years upto 1979/80, interregional movement of foodgrains was restricted, and urban consumers were supplied with the 'wage good' at subsidized prices through an elaborate rationing system. To compensate producers for the low output prices, input subsidies (fertilizer, irrigation, etc.) were provided (ASR, 1989). Subsidies on consumer food prices and agricultural inputs, however, began to impose a significant burden on budgetary resources of the government by the end of the 1970s. Since the early 1980's the government undertook price policy reforms under the aegis of structural adjustment policies which included withdrawal of food subsidies in the urban rationing system and instead targeting food subsidies to specific groups, e.g., rural poor through a rural (palli) rationing system; counteracting unexpected and large foodgrain price swings through open market sales in specific urban areas (which could in principle reduce the fiscal cost of food subsidies); withdrawal of agricultural input subsidies; privatization of import, management and distribution of fertilizer and irrigation equipment; and changing the output price policy to reflect "incentive" prices rather than procurement prices.

An interministerial committee sets a uniform procurement price for a particular crop season for the entire country based on estimates of average costs of production plus a 15% mark-up. If the procurement price is realized, producers with average cost or below-average costs of production receive a minimum 15% return over costs. The government's definition of "incentive" price is, however, average cost of production plus a 10% markup.

Procurement prices have been announced in all years for the major rice crop, i.e., Aman (Table 2.1). For boro i.e., the dry season modern variety rice, it has been announced since the 1982/83 crop year. Procurement prices of wheat have been announced since 1975/76. Announcement of procurement prices are made few weeks before initiation of the program. Procured quantities have however, been very small, no more then 2.5% of domestic net production of rice which amounts to about 7% of marketed surplus. In case of wheat grower's prices have been lower than procurement price except in eight years out of sixteen years for which data were available (Table 2.1). Though government procurement have not influenced the determination of market prices of rice and wheat significantly, it is likely that grower's price would have been lower than observed market prices in the absence of public procurement.

Table 2.1

Procurement Prices and Farmgate Prices of Rice, Wheat, and Sugarcane

Year	Rice (Medium)		Paddy (Aman)		Wheat		Sugarcane	
	Procure-ment Price	Whole-sale Price	Procure-ment Price	Farm-gate Price	Procure-ment Price	Farm-gate Price	Procure-ment Price	Farm-gate Price
1973-74	1945.92	2831.00	1203.65	1688.90	n.a.	2079.63	160.75	160.43
1974-75	3215.07	5779.00	1982.63	2964.43	n.a.	3804.94	214.34	319.87
1975-76	3215.07	3382.00	1982.63	1921.27	1929.04	1546.19	267.92	279.51
1976-77	3215.07	3023.00	1982.63	1965.46	1982.63	2148.52	267.92	281.48
1977-78	3590.17	3877.00	2250.55	2131.79	2143.38	2197.73	281.32	297.23
1978-79	3643.75	4216.00	2304.14	2680.77	2304.14	2216.43	334.90	337.58
1979-80	4420.73	5657.00	2813.19	2939.82	2813.19	2783.34	334.90	374.98
1980-81	4554.69	4770.00	2947.15	2854.20	2947.15	2999.86	401.88	409.43
1981-82	5090.10	6060.00	3322.20	3336.46	3322.20	3643.53	455.50	444.86
1982-83	5626.00	6700.00	3616.90	3608.10	3616.90	4018.52	455.50	444.86
1982-84	6028.20	7450.00	3858.10	4359.05	3858.10	3914.19	455.50	455.69
1984-85	6617.70	8250.00	4420.30	4042.14	4340.00	4160.24	535.80	522.61
1985-86	6832.00	6620.00	4554.70	4456.49	4554.70	4551.70	643.00	656.47
1986-87	7100.00	9160.00	4688.60	5255.66	4032.60	5216.26	669.80	672.21
1987-88	8251.00	9970.00	5358.00	4844.00	5358.00	5201.00	669.80	683.00
1988-89	8664.60	9810.00	5626.40	5608.64	5626.40	5717.59	736.70	767.33
1989-90	9071.20	9920.00	5894.80	5487.83	5894.30	6177.72	964.50	1080.72
1990-91	9900.00	10550.00	6430.00	5579.09	6430.15	6162.00	n.a.	920.00

Source: B.B.S. Statistical Yearbook, various issues.

Note: n.a. - not available.

2.2 Jute

The government has implemented a "minimum price support" policy intended to be remunerative to producers of jute. In case of jute, minimum export prices have also been in force. The jute industry was entirely in the public sector until the early 1980s. Currently, around 50% of the mills are still in the public sector. The Bangladesh Jute Corporation (BJC) and the Bangladesh Jute Mills Corporation (BJMC) procure raw jute through purchasing centres across the country at minimum prices announced few weeks prior to procurement typically from August to October, i.e., immediately following harvest in July and August. The minimum price policy was discontinued in 1990/91. However, it was quickly reimposed at the export level and the government is considering reimposition of minimum prices at the growers level again from the 1992/93 season.

2.3 Sugarcane

The sugar industry is entirely state-owned. Sugar mills procure sugarcane at prices set by the government. Only 30% of the production of around 7 million tons of sugarcane is used by the industry, the remaining production is consumed by the domestic 'gur' or molasses industry. A small quantity is also directly consumed as sugarcane juice by consumers. Procurement prices were below growers' prices in 12 out of 18 years.. Thus, the market price is determined largely by domestic supply and demand at the grower's level.

2.4 Cotton and Tobacco

Cotton and Tobacco are rather minor crops in Bangladesh. Though, minimum prices are announced by the government these do not appear to be effective. While a significant part of the textile industry is still state-owned, the tobacco industry is predominantly in the hands of a single multinational company. At present, the Bangladesh Textile Mills Corporation (BTMC) procures only 30% of the domestic cotton production directly while, the remaining 70% is procured by the private trade. Upto 1984/85 privatization of the state-owned textile sector was insignificant. Thus, upto the year an administered pricing regime was implemented to set cotton fiber prices at the farmgate level and government procurement of raw cotton would take place at the fixed price. However, since 1985/86 administrative pricing has been withdrawn. Cotton producers are free to sell cotton to the government (at designated purchase centers) or to the private traders. The minimum price for tobacco is intended to be merely indicative since there is no government procurement and reflects the governments' concern about exploitation of tobacco grower's by the multinational company. Support prices of cotton and tobacco are, however, not available in published form.

Section Three

Trade and Commercial Policies

3.1 Manufacturing Sector

The Import Policy delineating import tariffs and quantitative restrictions has been the major trade policy instrument influencing incentives in the economy. The degree of restriction determines not only the profitability of import substituting industries but also has significant implications for export-oriented industries and inter-sectoral resource allocation. High rates of protection may create more distortions than they offset. Moreover, when import restrictions take the form of pervasive non-tariff barriers, policy makers themselves may not be aware of the magnitude of protection being enjoyed by different industries.

In Bangladesh, even though import tariffs have been high, on most imports until the mid-1980s non-tariff restrictions were generally the binding constraints on imports. Though the Government initiated reforms to liberalize the trade policy regime in the mid-1980s, major steps towards trade liberalization have been undertaken only since 1988. These trade policy reforms were aimed at (i) removing quantitative restrictions, (ii) decreasing tariff levels, (iii) rationalizing the tariff structure, and (iv) simplifying trade procedures.

3.1.1 Quantitative Restrictions (QRs)

In January, 1985 the import control system was changed significantly. The Positive List (specifying items which could be imported) was changed to a Negative List (which specified items that could not be freely imported) with the implications that any item that was not on the list could be imported, either freely or by fulfilling specified requirements. The Restricted List was left intact. Targeted reduction of tariffs and rationalization of the tariff structure took place along with rapid phasing out of the QRs through an amendment to the Import Policy Order (IPO) in May 1988. Two major changes in the IPO of 1989/90 and 1990/91 took place, i.e., the IPO would henceforth remain in force for two years instead of one and the Negative and Restricted Lists of imports were amalgamated into one Control List. Thus, policy continuity and much greater ease in import procedures were provided. The number of categories containing banned items was reduced by 20 per cent per year with priority for removing bans in the steel, chemicals, textile and light engineering sectors. From July, 1986 to July, 1990 the number of four-digit categories in the Negative and Restricted Lists were reduced from 648 to 343. The remaining items include many products which compete with domestic production. The ambitious target of phasing out all QRs by 1990/91 has remained unachieved. Since July 1990 the number of 4-digit items subject to controls has been reduced by about 25 per cent. Allowing for some new restrictions there has been an effective reduction of about 18 per cent in the Control List.

Removal of QRs has been the main objective of the trade policy reforms initiated in the mid-1980s and have been stepped-up since 1988. Imports subject to QRs fall into three categories,viz. Banned, Restricted and Mixed. A frequency index based on tariff line coverage shows that the proportion of total HS codes at the 8-digit level subject to QRs has decreased from 47% in 1986 to 36% in 1990. The decline was more pronounced for banned items whose tariff line coverage declined from 9.1% to 5.1% in the same period. This reduction was undertaken under the provisions of the World Bank Industrial Sector Credit (ISC)-1 which stipulated a 20% per year reduction of items on the Control list. Restricted tariff headings, which account for 55% of all codes subject to QRs showed the least decline. The frequency index for this category decreased from 24% in 1986 to 20% in 1990.

In terms of trade coverage, imports facing QRs account for about 52% of total imports. In this case also, the most important category of QRs is the restricted one, accounting for 49% of total imports and 95% of QR imports. Another important characteristic of QR imports is that 90% of the items enter under a normal tariff rate while, the rest enter at concessionary rates. For freely imported items the distribution is more balanced, i.e., 56% face the normal tariffs and 44% enjoy concessionary rates. However, tariff rates whether normal or concessionary, are very different for QRs and free imports. Imports facing QRs in the manufacturing sector in the July-December 1990 period were:

Manufacturing (total) sector : 27.5%
Textile and leather : 69%
Food, beverage and tobacco : 43%
Metal products, machinery : 19.8%

The textile and leather, and food sectors rely heavily on QRs. By contrast, imports of basic metals (0.88%) and non-metalic minerals (2.2%) face very little QRs. However, the above data should be viewed with caution since they may reflect seasonal effects being based only on a six-month period i.e. July-December 1990. While, QR imports comprise 27.5% of total imports in the manufacturing sector, the share of QR imports in the agriculture sector is 41.9% (Rahman, 1992).

Under the World Bank ISC-2 all items on the Control List would have to be removed with exceptions for products under control for security, health, safety and religions (non-trade) reasons, in two phases i.e., by June 1991 and June 1992. The IPO 1989-91 specifies 326 items at the 4-digit in the Control List. Since 70 tariff lines were removed in July 1990, 256 item remain on the Control List. The World Bank has determined that 73 of these items would stay in the List as per the non-trade criteria. Thus, 92 items would have to be taken out of this list in each of the two fiscal years i.e., FY1991 and FY1992. The IPO for 1991-93 shows that 96 4-digit items have been removed from the Control List.

3.1.2 Tariff Structure

Taxation of imports in Bangladesh have included a combination of customs duties, sales taxes, development surcharges(DSC) and license fees. Sales taxes are imposed on duty-paid value of imports, while tariffs, DSC and license fees are levied on the c.i.f. value of imports. Sales tax is levied only on imports in Bangladesh and hence is an import tax. Tariffs are the most important of the taxes. In regard to tariffs the government publishes a series of statutory rates which are the highest rates that can be legally levied, although the operative rates are in many cases much lower because of various exemptions and concessions (for example, to stimulate investment in priority sectors, promote export-oriented industries and induce business in less developed areas). Reforms in connection with tariff rationalization and reduction have aimed specifically at: (a) reducing maximum tariff rates to 100% (with the exception of luxury goods); (b) limiting customs duties to a maximum of 20% on raw materials, 75% on intermediate products and materials and 100% on final products; and (c) restructuring import tariffs in the textile and steel and engineering sectors so that the nominal tariffs in these sectors would be in the range of 0-85%. These objectives, however, could not be achieved until December 1991.

To assess the effects of trade policy liberalization relating to imports statutory tariff rates of 1982/83 were compared to those of 1989/90, i.e., one year after the significant import policy changes relating to tariffs and QRs

began. The distribution of statutory tariff rates shown in Table 3.1 are based on 106 imported manufactured products covering approximately 60% of total import value and 95% of manufacturing output. There are significant increases in the headings in 40% and 50% duty slabs in 1989/90. The 75% duty slab was withdrawn and rates of 100% and above applied to only 29.25% of the items covered in 1991 compared to 52.83% in 1982/83. Though, the weighted average tariff rate increased somewhat, the dispersion of the tariff rates measured by the coefficient of variation decreased from 0.70 in 1982/83 to 0.59 in 1989/90. Thus, significant trade policy reforms have taken place.

Table 3.1

Distribution of Import Tariffs in the Manufacturing Sector

Tariff Rate (per cent)	Percentage of Import Items	
	1982/83	1989/90
20	13.21	10.38
40	5.66	28.30
50	18.87	31.13
75	6.60	-
100	28.30	22.64
150	18.87	1.89
300	5.66	4.72
Average rate	92.88	103.11
Coefficient of Variation	0.71	0.59

Source: Rahman 1992b.

3.2 The Agriculture Sector

Nominal tariffs under the 1991-93 Import Policy on agricultural commodities and inputs are shown in Table 3.2. The tariffs rates on essential agricultural commodities e.g. foodgrains, pulses and spices are lower. High tariffs apply to fruits and vegetables e.g., brinjal, cauliflower, cabbage, etc.. In the absence of quantitative restrictions (QRs) and special concessions/exemptions on tariff rates on agricultural importables, the nominal tariff rates shown in Table 3.2 would indicate the actual measure of nominal protection to the agricultural commodities in question. However, in the presence of QRs and special concessions on duties, direct price comparison provide a better measure of nominal protection to each product or sector. Section 4 is, therefore, devoted to an extensive discussion on nominal protection to agricultural products.

In keeping with the overall restrictive trade policies, international trade in agricultural commodities was also highly restricted. Most agricultural commodities still appear on the Restricted or Banned List of imports. Export policy towards agricultural commodities continues to impose serious restrictions on their exports. Raw jute, the single largest agricultural commodity export was directly taxed until 1981. Outright bans have been imposed on raw jute exports in years of scarcity in order to maintain supplies

Table 3.2

Operative Tariff Rates (1991)

Agricultural Products	Customs Duty	VAT
Foodgrains		
Aus	0.3	0
Aman	0.3	0
Boro	0.3	0
Wheat	0.3	0
Gram	0.3	0
Barley	0	0
Maize	0	0
Pulses		
Masur	0.2	0
Mung	0.2	0
Mashkalai	0.2	0
Khesari	0.2	0
Oilseeds		
Til	0.6	0
Rape & Mustard	0.2	0
Linseed	0.6	0
Spices		
Chilies(Dry)	0.3	0
Onion	0.3	0
Coriander seed	0.6	0
Garlic	0.3	0
Turmeric	0.6	0
Ginger	0.3	0
Fiber		
Jute	0.6	0.15
Cotton	0.05	0
Sunhemp	0.6	0.15
Fruits		
Banana	0.5	0
Sugarcane	0.6	0
Mango	0.5	0
Pineapple	0.5	0

Table 3.2 (Contd.)

Agricultural Products	Customs Duty	VAT
Fruits (Continued)		
Jack Fruit	C	0
Water Melon	0.5	0
Vegetables		
Brinjal	1.5	0
Cauliflower	1.5	0
Cabbage	1.5	0
Tomato	1.5	0
Potato	1.5	0
Sweet Potato	1.5	0
Groundnut	0.6	0
Mushroom	1.5	0
Motor (Pea)	0.6	0
Beans	1.5	0
Cucumber	1.5	0
Barbati	1.5	0
Others		
Tobacco	0.3	0.15
Betel Nut	1	0
Betel Leaves	0.6	0
Tea	0	0
Agricultural Inputs	**Customs Duty**	**VAT**
Fertilizer		
Urea	0	0
TSP	0	0
MP	0	0
Insecticides/ Pesticides	0	0.15

Source:-

1. S.R.O NO:150 Law/91/1368/Customs;Dated: 12th June 1991;NBR;IRD;M/O Finance
2. Bangladesh Customs Tariff (Based on the Harmonized Commodity Description & Coding System) 1987;NBR;IRD; M/O Finance
3. Finance Ordinance 1991; 30th June 1991

of the fiber to domestic jute mills at stable prices. Most agricultural commodities are perceived as essential products, e.g., edible oils, oilseeds, pulses, spices, etc. and are not permitted to be exported. While, imports under licensing schemes in the secondary foreign exchange market has been allowed since the late 1970s for essential commodities stated above, trade in agricultural commodities has continued to be highly restricted. The post-1988 trade policy reforms did not affect agricultural commodities upto the 1990/91 fiscal year.

While restrictive import policies were aimed at ensuring remunerative prices to producers, sheltering domestic producers from external competition and achieving self-sufficiency, restrictive export policies were mainly aimed at ensuring domestic availability and equitable consumer prices. The objectives of the overall "anti-trade" policy, however, appears to have been price stability in agricultural commodity markets by insulating the domestic markets from the instability of world commodity markets.

Section Four

Analysis of Exchange Rate[1]

4.1 Evolution of the Policy

A fixed exchange rate policy was implemented during the 1970s. In August 1979, the fixed exchange rate policy was replaced by a "managed" flexible exchange rate policy in which the Taka was pegged to a basket of currencies of Bangladesh' major trading partners, weighted according to their bilateral foreign exchange transactions with Bangladesh. The weights were changed a few times in the 1980s to reflect changing trade weights. Since early 1983 the intervention currency was has been the U.S. dollar. Earlier, it was the British pound sterling. Since, 1985 a policy of frequent adjustment of the nominal exchange rate was adopted in consort with overall macroeconomic policy reforms under a 3-year IMF-SAF program which was to become operative the following year. The primary objective of the frequent exchange rate depreciation was to prevent overvaluation of the exchange rate. The exchange rate policy was aimed at making exports more price competitive, eliminating budgetary subsidies for exports and help restrain import growth without reimposing quantitative restrictions. Combined with the trade and commercial policy reforms stated earlier the policy was expected to reduce smuggling, induce reallocation of resources in sectors of export orientation and import substitution, and encourage diversification and rapid growth of non-traditional exports.

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1. This section draws extensively on an earlier study by Rahman (1992c).

Two exchange rate markets viz. the official (primary) exchange rate market (OEM) and a secondary exchange rate market (SEM) have been operative since the mid-1970s. Multiple exchange rates thus, arose due to operation of the two markets. The SEM comprises the Wage Earner's Scheme (WES) and the Export Performance Benefit (XPB) Scheme. Foreign exchange remittances of overseas Bangladeshis, tourists and other service earnings are channeled for sale through the WES. A band for the WES rate is determined by a committee of authorized foreign exchange dealers comprising of commercial banks with the Bangladesh Bank participating as an observer. The actual WES market rate is then set within the predetermined band through auction. The spread between the WES and the official exchange rate was 12% in June 1985 but dropped sharply to 4.5% in June 1988 due to the frequent exchange rate adjustments in the 1984/85-1989/90 period. It was only 2% by 1991. Thus, by 1990/91 the foreign exchange market has been almost unified, which has resulted in greatly reduced XPB benefits. Assistance to exporters directly on value-added may therefore, have to be considered to compensate exporters. The scope of the SEM has been enlarged greatly since 1986/87. The share of imports transacted through the SEM increased from 12% in 1980/81 to 45% in 1988/89. In 1990/91, around 70% of the non-aid imports were transacted through the SEM.

4.2 Nominal and Real Exchange Rates

The official exchange rate does not reflect the actual price of foreign exchange to importers and exporters due to the existence of tariffs,

surcharges, license fees, etc. on imports and taxes and subsidies on exports. While taxes on imports (exports) increase the price of foreign exchange to importers (exporters), export subsidies reduce the price of foreign exchange. The official exchange rate adjusted for taxes and subsidies is, therefore, the effective exchange rate. Thus, we have:

$$EE_m = E\ (1+t_m),$$

and,

$$EE_x = E\ (1-t_x)$$

where, EE is the effective exchange rate, E is the official exchange rate, m and x represent imports and exports and t represents implicit import tariffs or export taxes. EE_m, EE_x and E are expressed in Taka per unit of foreign exchange (U.S. dollars). The effective exchange rate is a measure of the effect of trade policy on the exchange rate, i.e., the actual price of foreign currency.

Nominal tariff rates, however, do not provide a correct measure of nominal protection in the presence of quantitative trade restrictions (Lewis, 1969). When a QR is binding, it becomes the primary determinant of the differential between the border and domestic price. In other words, the border-domestic price differential exceeds the border price adjusted for the nominal tariff rate and normal marketing costs. Thus, average import tariff or export tax rates computed from *actual* tariff (tax) revenues and *actual* trade

value data, would yield a less accurate measure of the direct effect of trade policies on the exchange rate than implicit import tariff or export tax rates computed as the ratio of domestic to world price of imported goods.

With D_o and S_o as the export supply and import demand functions and a free trade equilibrium the quantity imported would be M_o and domestic price of $P_o = E.P_w$. However, when D_o and S_o are the demand and supply curves there is an external deficit in the current account given by $M_o - M_r$. With a tariff of t, import is M_t with price of $P_t = P(1+t)$. However, with a binding quantitative restriction on imports of M_r, the domestic price rises to $P_m = P_o(1+t_m)$. Thus, the nominal average import tax t understates the "true effect" of quantitative restrictions on domestic price given by t_m, i.e., the implicit tariff rate or the equivalent tariff rate.

The demands of data for computing implicit import tariff and export tax are exacting. In principle, detailed world and domestic price data on all traded goods would be required. But, such detailed price information on traded goods are not available for Bangladesh. World and domestic prices of certain categories of importables and categories of exportables covering approximately 51% of total import value and 90% of export value in 1985/86 were obtained from several different secondary sources.[1] These data were used to compute the

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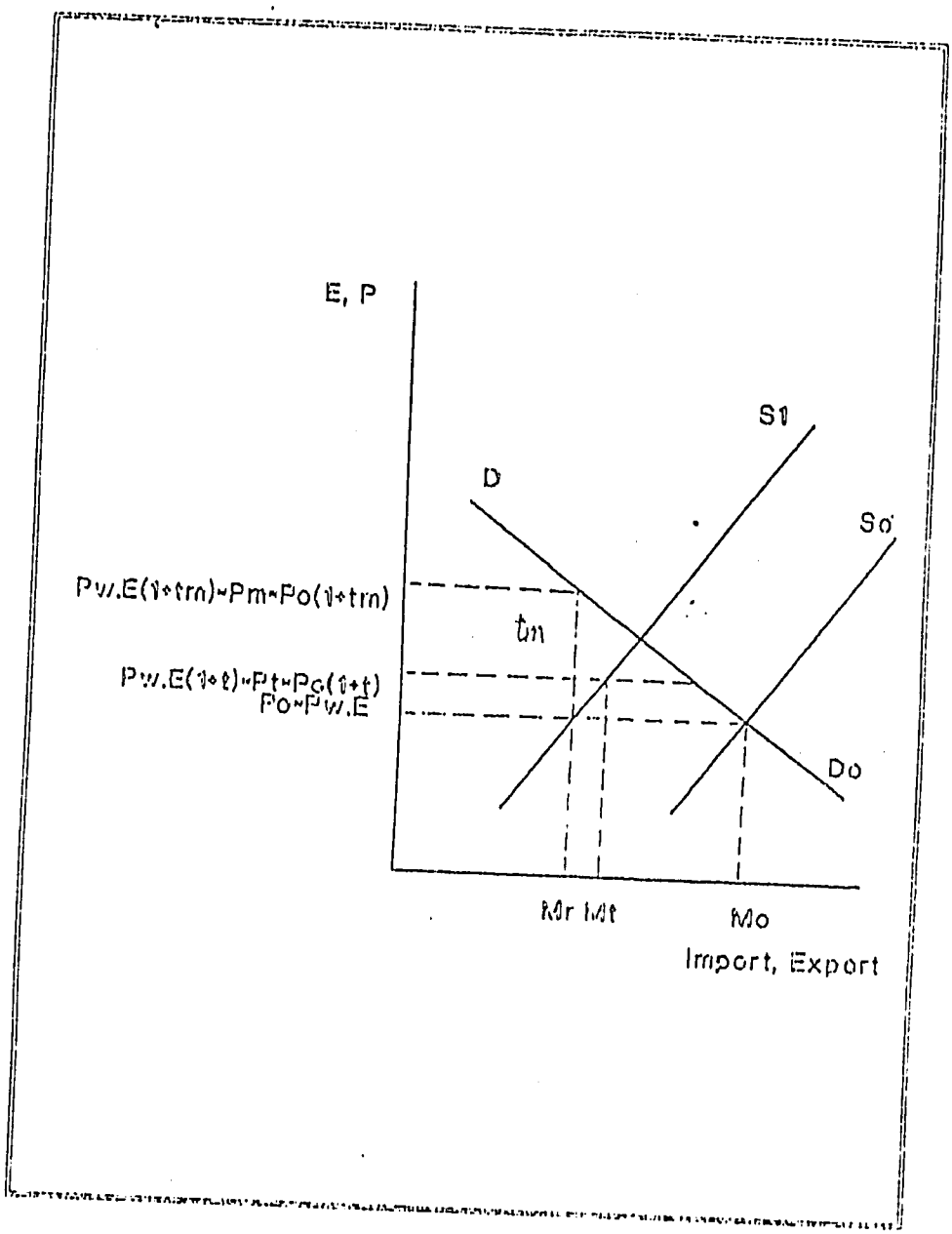
1. BBS (Foreign Trade Statistics, various issues), Ministry of Agriculture (Agriculture Sector Review), Planning Commission (Plan Documents) Ministry of Finance (Economic Survey, various issues), etc., World Bank (1990) IMF (IFS, various issues).

Figure 4.1

Import Restrictions and Equivalent Tariffs



average implicit import tariff rate and export tax rate. The average implicit tariff (tax) rate was computed as a trade-weighted average tariff rate where, shares of each import (export) category were used as weights. The equivalent tariff calculations thus computed, are shown in Table 4.1 and the average import tax computed as total import tax revenues divided by total value of imports is shown in Table 4.2. The weighted average import tax for the entire period is also trade-weighted.

The estimates show that quantitative restrictions have caused domestic prices to deviate very significantly from their border equivalents. While the average import tax was only 23% in 1985/86, the implicit import tax was 34%. In other words, only 68% of the economic rents accruing from quantitative import restrictions were captured by the import taxes.

Implicit tariffs (t_m) and taxes (t_x) over time were constructed using price indices of import and export goods as follows:

$$\frac{P^d_m}{EP^w_m} = 1 + t_m, \text{ and } \quad \frac{P^d_x}{EP^w_x} = 1 - t_x$$

where, P_m and P_x denote import and export price indexes respectively, E denotes the official exchange rate (OER), and the superscripts d and w indicate domestic and world prices. The world price indexes, P^w_m and P^w_x are import and export unit values based on actual values and quantities of Bangladesh' external trade. The domestic price indices P^d_m and P^d_x were constructed using the domestic wholesale prices of major imports and exports.

Table-4.1

Equivalent Tariff Calculation for 1985-86

Export Items	Export Value	Share	Wholesale Price	Export Price (f.o.b.)	NRPX
1. Frozen Shrimps, Frog Leg & Fish	3427	0.1455	51030	58098	0.1217
2. Newsprint	219	0.0093	14116	15078	0.0638
3. Paper	91	0.0039	107	120	0.1083
4. Naptha	416	0.0177	8140	5196	-0.5666
5. Furnace Oil	174	0.0074	5704	3893	-0.4652
6. Garments	3929	0.1669	56	67	0.1665
7. Raw Jute	3702	0.1572	6640	9041	0.2434
8. Jute Goods	8794	0.3735	18993	18993	0.0000
9. Tea	979	0.0416	25000	32838	0.2387
10. Leather & Leather Products	1815	0.0771	29	25	-0.1600
Total Exports	23546			Total	0.0689[a]

Note: a. Weighted average of the nominal rates of protection using trade weights.

Table-4.1 (Contd.)

Equivalent Tariff Calculation for 1985-86

Import Items	Import Value	Share	Wholesale Price	Export Price (c.i.f.)	NRP
11. Rice	333	0.0112	6620	5459	0.2127
12. Wheat	3829	0.1282	5224	3285	0.5903
13. Edible Oil:					
Soyabean	879	0.0295	24386	14486	0.6834
14. Coconut Oil	657	0.0221	39650	21033	0.8851
15. Sugar	846	0.0284	25524	11486	1.2222
16. Crude Petroleum	5291	0.1776	5406	5249	0.0299
Petroleum Products:					
17. Kerosene	744	0.0250	9348	6888	0.3571
18. Diesel	2415	0.0811	9425	8200	0.1494
Fertilizer:					
19. Urea	1124	0.0377	3470	5327	-0.3486
20. TSP	1976	0.0663	6472	4843	0.3364
21. Cement	1568	0.0526	2200	1203	0.8288
22. Raw Cotton	1542	0.0518	77205	47859	0.6132
23. Cotton Yarn	1494	0.0502	197600	146930	0.3449
24. Cotton Fabric	1455	0.0488	30	25	0.2000
25. Pig Iron	497	0.0167	6652	4873	0.3650
26. Steel Billets	47	0.0016	11456	18439	-0.3787
27. M.S. Rod	643	0.0216	15472	12734	0.2150
28. M.S. Plate	2025	0.0680	15472	14018	0.1037
29. Diesel Engine	224	0.0075	20405	15030	0.3577
30. TV (Including Radio, Monitors, Projector)	287	0.0095	6897	2708	1.5469
31. Textile & Leather Machine	1039	0.0349	29781	26125	0.1400
32. Transport Vehicle	105	0.0035	841406	74856	0.7719
33. Motor Vehicle	258	0.0087	654427	70632	0.3905
34. Motor Cycle	517	0.0174	20929	16017	0.3067
Total Imports	29786				Total 0.3415[a]

Source: B.B.S. Statistical Yearbooks various issues, World Bank (1984), World Bank (1990).

Note: a. Weighted average of the nominal rates of protection using trade weights.

Table-4.2

Average Import Taxes

(Value in crore taka)

Year	(1) Sales Tax	(2) Import Duty	(3) Total Import Tax	(4) Imports	(5) Average Tax (%)	(6) Equivalent Tariff (%)
1974	43.40	117.90	161.3	732.00	22.04	176.12
1975	61.88	151.20	213.08	1,084.00	19.66	111.08
1976	119.69	341.87	461.56	1,470.00	31.40	45.01
1977	123.00	268.74	391.74	1,399.00	28.00	51.45
1978	174.59	414.41	589	1,827.00	32.24	49.73
1979	230.14	487.64	717.78	2,334.00	30.75	27.44
1980	270.00	591.60	861.6	3,676.00	23.44	45.98
1981	340.00	710.70	1050.7	5,216.00	20.14	44.10
1982	350.00	765.20	1115.2	5,236.00	21.30	36.24
1983	316.00	899.30	1215.3	5,489.00	22.14	45.09
1984	345.00	993.10	1338.1	5869.00	22.80	65.90
1985	410.00	1,104.42	1514.42	6,874.00	22.03	54.17
1986	440.00	1,193.90	1633.9	7,065.00	23.13	34.15
1987	550.00	1,537.40	2087.4	8,026.00	26.01	33.97
1988	525.00	1,618.00	2143	9,329.00	22.97	31.55
1989	540.00	1,807.30	2347.3	10,848.00	21.64	24.06
1990	530.85	2,151.75	2682.6	12,375.00	21.68	20.44
				Average	24.20	52.15

Source: B.B.S. Statistical Yearbook, various issues, World Bank (1984), World Bank (1990).

Note: (3) = (1) + (2)
(5) = (3)/(4)
(6) = See Table 4.3.

Figure 4.2, depicts the inter-temporal behavior of the implicit import tariff and export tax. the implicit tariffs on imports were very high in the early 1970s. By contrast, the export subsidy was much lower. Both the implicit tariff rate and export subsidy declined sharply in 1975/76 following a large devaluation in May 1975. Though implicit tariffs did not change very significantly between 1975/76 and 1984/85 with few exceptions, the rate has been declining since 1984/85. In 1990/91 exports were subject to an implicit tax. Implicit import tariffs on the other hand, have ranged from 5% to 44% in the 1980s. These were made before in the 1970s. Implicit export subsidies ranging from -3% to 40% remained virtually unchanged at a low 2% from 1986/87-1989/90. Though, the OER was held fixed at around Tk. 15 per U.S. dollars from 1975/76-1979/80, the effective exchange rate for imports ranged from Tk. 19.4 to Tk. 23.4 per U.S. dollar and the effective exchange rate for export ranged from Tk. 15.8 to Tk. 18.7 per U.S. dollar (Table 4.3).

The sharp decline in the OER in 1975/76 reflects the large devaluation of the Bangladesh taka in May 1975 from Tk. 8.87 per U.S. dollar to Tk. 15.05 per U.S. dollar. The devaluation resulted in a significant decline in both the implicit import tariff and export subsidy. The effective exchange rates for imports and exports increased by 17% and 33%, respectively in response to the much larger OER devaluation of nearly 70%. The equivalent tariff declined from 1.46 in 1974/75 to 1.28 in 1975/76 reflecting a significant decrease in the trade policy bias against exports. Following the shift to a flexible

Figure:--4.2

Bangladesh Implicit Trade Taxes

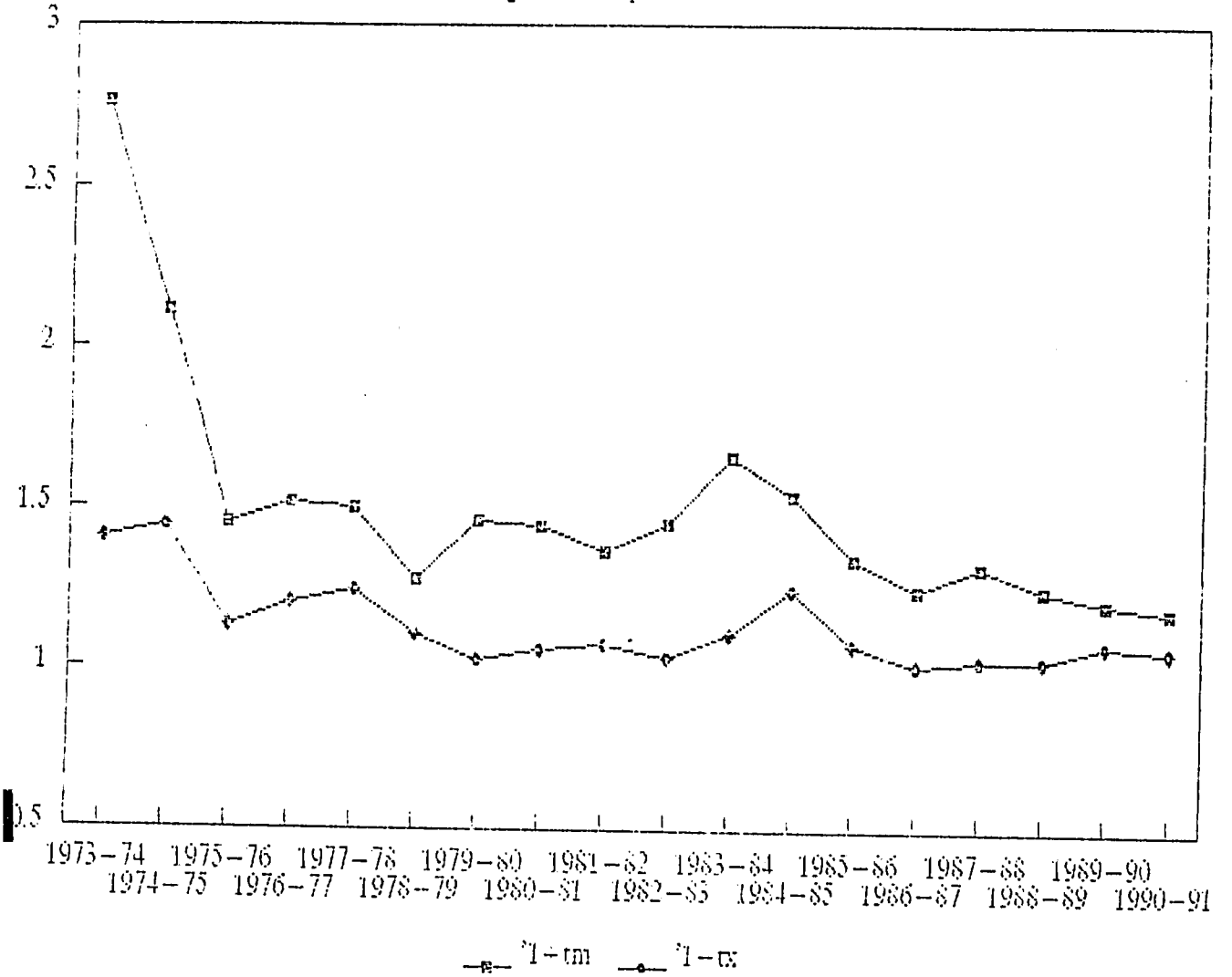


Table-4.3

Tariffs and Effective Exchange Rates,
Bangladesh 1973-74 to 1990-91

Year	$1+t_m$ (1)	$1-t_x$ (2)	EQT (3)	OER (4)	EX (5)	EM (6)
1973-74	2.761	1.404	1.967	7.966	11.184	21.997
1974-75	2.111	1.442	1.464	8.875	12.798	18.734
1975-76	1.450	1.128	1.286	15.054	16.978	21.829
1976-77	1.515	1.200	1.262	15.426	18.516	23.363
1977-78	1.497	1.239	1.209	15.117	18.725	22.635
1978-79	1.274	1.101	1.158	15.223	16.755	19.400
1979-80	1.460	1.020	1.431	15.490	15.805	22.612
1980-81	1.441	1.052	1.370	16.259	17.100	23.428
1981-82	1.362	1.069	1.275	20.065	21.440	27.337
1982-83	1.451	1.031	1.408	23.795	24.525	34.525
1983-84	1.659	1.101	1.507	24.944	27.459	41.380
1984-85	1.542	1.239	1.244	25.963	32.164	40.028
1985-86	1.341	1.069	1.255	29.886	31.945	40.092
1986-87	1.240	1.004	1.234	30.629	30.766	37.971
1987-88	1.316	1.025	1.284	31.242	32.018	41.101
1988-89	1.241	1.022	1.214	32.142	32.838	39.876
1989-90	1.204	1.068	1.127	32.921	35.171	39.650
1990-91	1.177	1.054	1.117	35.690	37.612	42.001

Source: Own Calculations.
Notes:

1.Col (1): $1+t_m$ = PMt/(Et*PMt*), where PMt = Weighted Average of Domestic wholesale Price of Importables,PMt* = Dollar Price Index of Imports, Et= Ei/Eb,Where Ei is Exchange Rate of ith year & Eb is Exchange Rate for 1985-86.

2.Col (2): $1-t_x$ = PXt/(Et*PXt*), where PXt = Weighted Average of Domestic wholesale Price of Exportables,PXt* = Dollar Price Index of Exports, Et= Ei/Eb,Where Ei is Exchange Rate of ith year & Eb is Exchange Rate for 1985-86.

3.Col (3): EQT=(1)/(2)

4.Col (5): EX =Effective Exchange Rate for Exports=(4)*(2)

5.Col (6): EM =Effective Exchange Rate for Imports=(4)*(1)

foreign exchange rate policy in 1979/80, frequent adjustments to the exchange were made throughout the 1980s. From 1980/81 to 198586 the OER declined from Tk. 16.28 to Tk. 29.89, i.e., by 83.5%. Adjustment of the OER, however, were much slower in the second quinquennium of the 1980s. The OER declined by only Tk. 3 per U.S. dollar between 1985/86 and 1989/90. The implicit export subsidy declined following the shift to an adjustable-peg exchange rate regime. The subsidy has been low with the exception of 1984/85 when abnormally high domestic jute prices (historically highest) increased the implicit export subsidy above 20%. Thus, the effective exchange rate for exports was closer to the OER and declined steadily with the depreciation of the latter. Though, accelerated trade policy reforms since 1988/89 have caused the implicit tariffs to decline, the overall trade policy bias against exports was significantly large even in 1990/91.

4.3 The Real Exchange Rate (RER)

The world price of tradables in domestic currency relative to the price of home goods is the real exchange rate, i.e.,

$$RER = E^* \frac{P_t^W}{P_h}$$

where P^W_t and P_h are the world price of traded goods and the domestic price of home goods, respectively and E is the OER. Changes in the RER thus represent changes in the relative incentives enjoyed by domestic producers of tradable goods.

Data on P^W_t and P_h were needed to compute the RER since E was already available. A weighted average of the wholesale price indices of Bangladesh' major trading partners was used to represent P^W_t. Hence,

$$P^W_t = \sum_i w_i \frac{WPI_i}{E_i}$$

where, w_i, WPI_i and E_i are the weight, wholesale price index and exchange rate in units of the ith country's own currency per U.S. dollar (Appendix B). The weights are average share of trade (export plus imports) of Bangladesh' leading trading partners from 1973/74 to 1989/90. In this study 17 countries were included in order to compute trade weights. Among these 12 countries account for approximately 66% of Bangladesh' total import trade and the remaining 5 countries account for 60% of the total exports in the stated period. The CPI was used as a proxy for the prices of home goods on the assumption that it includes a larger proportion of non-traded goods and services than the WPI.

The effective RER indices for imports and exports were computed (with 1985/86 as the base year) as follows:

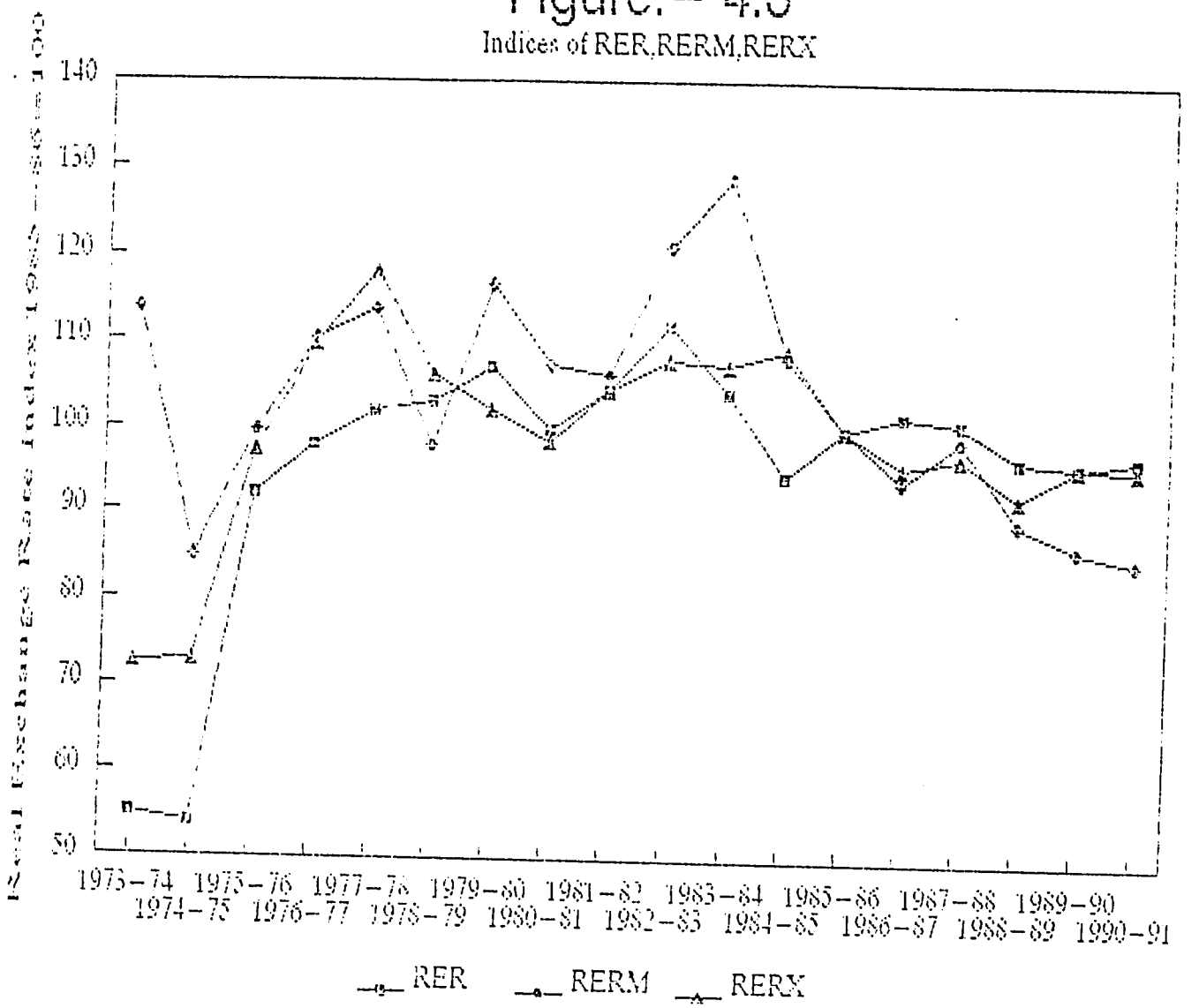
$$RER_x = RER\ (1-t_x)$$

$$RER_m = RER_x\ .(1+t_m)/(1-t_x)$$

The inter-temporal behavior of the RER_x and RER_m are shown in Figure 4.3. The 70% devaluation of the OER in 1975/76 did result in a RER devaluation of equivalent proportion. But, the depreciation in the RER_m was only 17%. However, a 15% downward adjustment of the OER in 1985/86 caused only a 6% depreciation of RER but a small appreciation of the RER_x. The most significant feature of the real exchange rate behavior depicted in Figure 4.3 is the appreciation of the RER and RER_x in particular, in the latter-half of the 1980s compared to the first quinquennium, in spite of steady nominal exchange rate depreciation throughout the decade. This is due to the strong domestic inflationary response caused in important measure by the nominal exchange rate depreciation policy itself (Rahman, 1992). Another important aspect of RER behavior depicted in Figure 4.3 is the persistent 'anti-export' bias. The ratio of RER_x to RER_m shows the relative incentives to exporters; the ratio has been consistently less than one. However, trade liberalization since 1988/89 has reduced the trade policy bias against exports significantly.

Figure:– 4.3

Indices of RER,RERM,RERX



4.4 Factors Influencing the Real Exchange Rate

Changes in the effective RER can be brought about by the variations in the world prices relative to prices of non-traded goods and/or by changes in the implicit import tariff and export tax, i.e., commercial policies. Even when the nominal exchange rate is fixed, equilibrium between the traded and non-traded goods market can be brought about by adjustments in the effective RER (Dornbusch 1974, Garcia 1981). Tariffs on imports and taxes on exports affect the RER by changing domestic supply and demand. The incidence parameter, omega, defined as the percentage change of the RER_X for exportables due to a one percent change in domestic prices of importables relative to exportables (P_m/P_X), shows the degree to which an increase in the domestic price of imports causes an increase in the demand for home goods and hence, their price (Sjaastad, 1980). Thus, the larger the substitution between tradables and non-tradables, the greater is the value of omega.

Several other factors such as the external terms of trade, remittances of Bangladeshis living abroad, foreign aid, and the fiscal deficit are all likely to influence the determination of the real exchange rate. The effect of a rise in the world price of importables relative to exportables, i.e., a deterioration in the terms of trade consists of a direct effect and an indirect effect. The price increase is reflected in an increase in the domestic price of tradables relative to non-tradables. Due to substitution between imported and home goods there is a shift in the demand for home goods raising

its price, and hence, an appreciation in the RER. Thus, the substitution effect of a deterioration in the terms of trade on the RER is similar to that of an import tariff. The terms of trade effect also reduces purchasing power of exports or real income. This indirect income effect causes a decrease in the demand for home goods (and its price) and hence, a depreciation in the RER. Though, the a priori net effect on the RER is indeterminate the income effect is likely to dominate in Bangladesh.

Remittances of Bangladeshi expatriates and workers abroad emerged as a major source of foreign exchange earnings in the 1970s. A large proportion of the remittances are expended on home goods (including non-traded services such as housing, etc.) causing their prices to rise. With world prices unchanged this results in an appreciation of the RER. Foreign aid and grants are also partly spent on home goods causing their prices to rise, thereby, appreciating the RER. However, since aid and grants accrue to the government and not the private sector and the marginal propensity to consume of home goods relative to traded goods is likely to be different the magnitude of the effect of grants and aid on RER is also expected to be different from the effect of remittances (Dorosh and Valdes, op.cit.).

The large fiscal deficit in Bangladesh reflects government expenditures on both traded and non-traded goods. Public expenditure mainly consisting of outlays on non-traded goods and services such as investment in infrastructure, salaries, subsidies, etc. raises the relative price of non-traded goods

while, Government expenditure on traded goods is unable to affect their prices. Government expenditures thus causes the RER to appreciate.

The real exchange rate is specified as a function of trade policy, external terms of trade and other explanatory variables. The real exchange rate rather than the real effective exchange rate for exports was used in estimating the real exchange rate model below because, export taxes whether explicit or implicit have not been large in magnitudes.

$$\ln RER = c + b_1 LTRPOL + b_2 LTT + b_3 RREMIT + b_4 RAID\ b_5 RDEF + U$$

where, RER = Real Exchange rate index

c = the unit constant,
LTRPOL = log $(1+t_m)/(1-t_x)$),
LTT = log (P^w_x/P^w_m),
RREMIT = (private transfers in dollars divided by P^w_t)/real GDP index,
RAID = (total foreign aid plus grants to Bangladesh in U.S. dollars (divided by P^w_t)/real GDP index,

RDEF = (fiscal deficit)/real GDP index, and
U = Random disturbance term

The RER functions were estimated using the 2SLS method to correct for possible simultaneity between the RER and some of the explanatory variables particularly, the trade policy variable. Since, quarterly data were not available for Bangladesh, annual time series data from 1973/74-1990/91 were used in the econometric estimations. The econometric results are presented in

Table 4.4. The results show that the terms of trade, remittances, and foreign aid are not important determinants of the real exchange rate. But, the trade policy variable LTRPOL and the fiscal deficit both have the *a priori* expected signs and are statistically significant at the 5% error probability level or more in all the regressions. The DW statistic lies in the inconclusive range. Re-estimating the equations with correction for serial correlation correction even when the DW-statistic lies in the inconclusive range provides a more robust test. However, in small samples as in the present case, the DW statistic is only indicative and hence, auto-correlation corrections may not be meaningful.

The parameter estimate of the trade policy variable or b_1 , lies between -0.44 and -0.49, i.e., it is highly stable. Since, only the trade policy variable and the share of the fiscal deficit were important determinants, equation (2) was selected as the 'best' estimate of omega. Equation (2) in Table-4.4 shows that a ten percent increase in the equivalent tariff will lead to a 49% appreciation of the exchange rate. The results also show that an increase in the fiscal deficit would cause the real exchange rate to appreciate.

Table 4.4

Econometric Estimates of Real Exchange Rate Equations

	C	LTRPOL	LTT	PREMIT	RAID	RDEF	DW	R^2	$\bar{R}^2$
1.	-0.253 (0.311)	-0.4337** (0.1695)	-0.084 (0.159)	0.0001 (0.0001)	0.00009 (.0001)	-0.00002*** (0.000004)	2.2[illegible]	[illegible]	0.83
2.	-0.6223 (0.1183)	-0.491053*** (0.153)				-0.000021*** (0.0000028)	2.09	0.86	0.84
3.	-0.5279 (0.1279)	-0.4371** (0.165)	-0.0236 (0.155)			-0.00002*** (0.000003)	2.084	0.86	0.83
4.	-0.6183 (0.117)	-0.4747*** (0.157)		0.0001 (0.000094)		-0.000019*** (0.0000031)	1.94	0.87	0.84
5.	-0.6225 (0.234)	-0.4736** (0.162)			0.00008 (.0001)	-0.00002*** (.000004)	2.36	0.87	0.84

Source: Own Calculations.
Notes:
1. All regressions were estimated using the 2SLS method with annual time series data from 1973/74-1990/91.

2. Figures in parentheses show standard errors. Double and triple asterisks indicate significance at the 5% and 1% error probability levels, respectively.

4.5 Equilibrium Exchange Rate Analysis

4.5.1 The Omega Approach

The omega approach yields an equilibrium real exchange rate (e^*) based on the parameter omega, ø, which measures the incidence of the equivalent tariff $(1+t_m)/(1-t_x)$ on the real exchange rate. Since, the parameter ø shows the effect of a one percent change in the equivalent tariff on the real exchange rate, e, it allows computation of the *free trade* equilibrium exchange rate, i.e., when $t_m = t_x = o$. The RER, equivalent tariff, the adjustment factor or the percentage misalignment in the RER, and the equilibrium RER are shown in Table 4.5. The Table shows the percentage change in the RER when implicit tariff and export tax are zero, i.e., free-trade equilibrium prevails. Thus, in any given year the percentage decrease in the equivalent tariff $((1+t_m)/(1-t_x))$ needed to restore equilibrium in the external sector is multiplied by - ø (which shows the effect of a one per cent share in the equivalent tariff on the RER) to yield the desired percentage change (depreciation) in the RER in free trade equilibrium. The econometric estimate of ø defined earlier was -0.49. During the period preceding the move to an adjustable pegged exchange rate system, i.e., 1973/4 - 1978/79, the average equivalent tariff was 139%, and then decreased to 129% in the post 1978/79 period. Thus, removal of all trade barriers or complete trade liberalization would result in a smaller (10.7%) depreciation of the RER real exchange rate in the post-1978/79 period compared to 14% in the pre-adjustable pegged exchange rate period. The average equivalent tariff declined by over 18% in the 5-year period from 1975/76-1980/81 following the large devaluation of the Taka in May

Table-4.5

Calculation of Equilibrium Real Exchange Rate
(Omega Approach)

Year	RER (1)	EQTARIFF (2)	$(1+T)^{-W}$ (3)	EQRER (4)
1973-74	55.244	1.967	1.394	77.008
1974 75	53.964	1.464	1.206	65.066
1975-76	92.141	1.286	1.131	104.245
1976-77	97.752	1.262	1.121	109.575
1977-78	102.029	1.209	1.098	111.987
1978-79	103.061	1.158	1.075	110.752
1979-80	107.132	1.431	1.192	127.735
1980-81	100.017	1.370	1.167	116.741
1981-82	104.554	1.275	1.127	117.804
1982-83	112.025	1.408	1.183	132.511
1983-84	104.183	1.507	1.223	127.425
1984-85	94.278	1.244	1.113	104.967
1985-86	100.000	1.255	1.118	111.800
1986-87	101.579	1.234	1.109	112.637
1987-88	100.776	1.284	1.130	113.925
1988-89	96.438	1.214	1.100	106.086
1989-90	95.942	1.127	1.061	101.760
1990-91	96.763	1.117	1.056	102.151
Avg. 1973-74 to 1975-76	67.116	1.572	1.244	82.107
Avg. 1976-77 to 1980-81	101.998	1.286	1.131	115.358
Avg. 1981-82 to 1985-86	103.008	1.338	1.153	118.901
Avg. 1986-87 to 1990-91	98.300	1.195	1.091	107.312

Source: Own Calculations.

Notes:

(1) Real Exchange Rate Index (1985-86=100)

(2) Equivalent Tariff=$1+T=(1+t_m)/(1-t_x)$

(3) Percent misalignment in real exchange rate (w = -0.491)

(4) Equilibrium Real Exchange Rate Index [Columns (1)*(3)]

1975. However, implicit tariffs were high until the late 1980s in spite of the nominal exchange adjustment policy.

The estimated real exchange rate models shown in Table-4.5 may be used for analyzing the effects of trade and fiscal policies on the real exchange rate and for forecasting. Such analysis is, however, not within the scope of this study.

4.5.2 The Elasticity Approach

The elasticity approach uses the reduced form of a three-sector (exportables, importables and non-tradables) model to estimate the equilibrium real exchange rate (e^*) under free trade, which is equivalent to the equilibrium nominal exchange rate (E^*) for a given price of non-traded goods (Krueger, Valdes and Schiff, 1988). Two estimates of E^* may be obtained depending on whether the foreign exchange market clears completely, i.e., current account deficit is zero or, a current account deficit considered sustainable in the long run is assumed. The two estimates are denoted as E1 and E2, respectively. Estimates of the unsustainable part of the current account deficit, the implicit tariff protection to importable goods (t_m), the implicit export tax (t_x), and the demand and supply elasticities of foreign exchange are required to estimate E^*. The three-sector model of exchange rate determination, yields the reduced form solution of the equilibrium nominal exchange rate E^* as follows:

$$E^* = \left(\left(\frac{Q_o + Q_1}{n_s Q_s + n_d Q_d}\right) + 1\right) E_o \quad \ldots \quad \ldots \quad (10)$$

where, Q_o is the non-sustainable part of the current account deficit, Q_1 represents the excess demand for foreign exchange due to elimination of trade taxes, i.e., t_m and t_x, Q_s and Q_d are the supply of and demand for foreign exchange and n_s and n_d are the elasticities of supply and demand for foreign exchange, and E_o and E^* are the official and equilibrium nominal exchange rates which, as noted earlier correspond to the official and equilibrium real exchange rates, viz. e_o and e^*, respectively for a given level of prices of non-agricultural non-traded goods.

Both the omega and elasticity approach are similar in principle and yield comparable measures of e^* when, a current account deficit that is considered sustainable in the elasticity approach, reflects historically observed levels of capital (aid) inflows.

Using the elasticity approach, two sets of equilibrium exchange rates were calculated. These are shown in Table-4.6. The first set, E^*_1, of equilibrium exchange rates is calculated with zero tariffs and no deficit in the current account. The second set, E^*_2, is computed with zero tariffs and the observed current account balance each year reflecting the assumption that observed levels of external deficit are sustainable. The exchange rate E^*_2 is,

Table-4.6

Equilibrium Exchange Rates (Elasticity Approach)

Year	$1+t_m$	$1-t_x$	Q	OER	E^*_1	E^*_2
1973-74	2.761	1.404	5571.971	7.966	15.396	12.211
1974-75	2.111	1.442	5257.554	8.875	16.512	12.961
1975-76	1.450	1.128	4023.301	15.054	22.969	18.667
1976-77	1.515	1.200	6022.324	15.426	24.295	19.728
1977-78	1.497	1.239	7763.434	15.117	24.648	19.446
1978-79	1.274	1.101	5677.678	15.223	22.214	17.829
1979-80	1.460	1.020	9198.648	15.490	23.955	18.838
1980-81	1.441	1.052	10774.213	16.259	24.546	19.761
1981-82	1.362	1.069	11640.921	20.065	29.984	23.983
1982-83	1.451	1.031	15048.337	23.795	32.116	28.373
1983-84	1.659	1.101	23485.124	24.944	36.051	31.704
1984-85	1.542	1.239	31427.327	25.963	40.804	33.599
1985-86	1.341	1.069	18914.005	29.886	40.122	35.128
1986-87	1.240	1.004	13493.341	30.629	37.002	33.947
1987-88	1.316	1.025	23561.361	31.242	41.044	35.920
1988-89	1.241	1.022	19912.159	32.142	41.012	36.030
1989-90	1.204	1.068	22463.170	32.921	43.325	37.097
1990-91	1.177	1.054	22149.066	35.690	48.998	39.742

Source: Own Calculations.

Note:

Q=Current account imbalance due to trade taxes and quotas

$=[t_m/1+t_m]*m*n_d - [t_x/(1-t_x)*(x+remit)]*e_x$ Here $n_d=-1, e_x=1$.

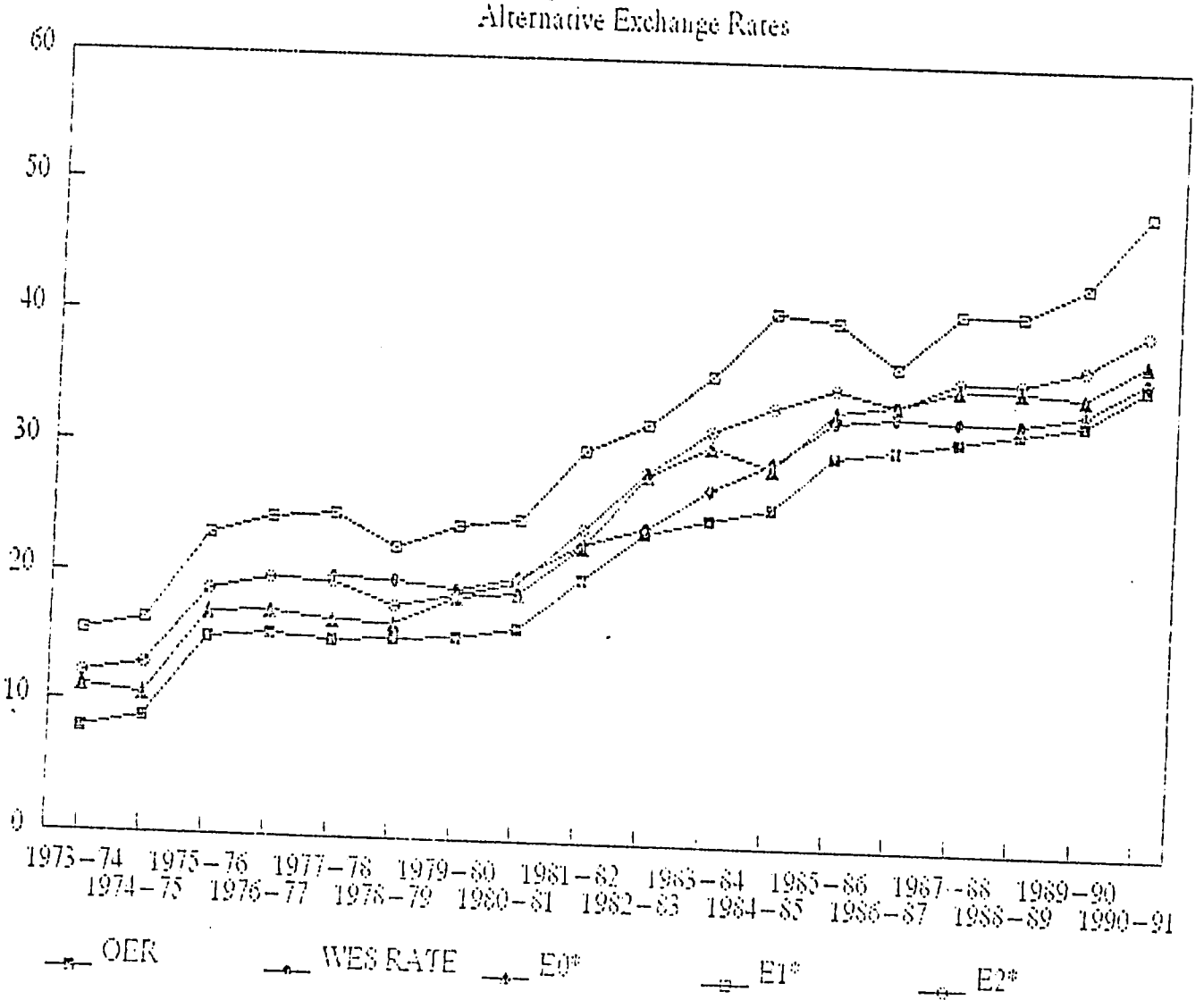
$E^*_1 = E*[(\text{Current Account Deficit} + Q)/(M*n_d+(X+Remit)*e_x)+1]$

$E^*_2 = E*[Q/(M*n_d+(X+Remit)*e_x)+1]$

therefore, more directly comparable to the RER computed using the omega approach. Remittances were added to exports in estimating the current account balance in calculating E^*_2. In both computations, the export supply elasticity is assumed to be 1 and the import demand elasticity is assumed to be -1. Figure 4.4, depicts the behavior of the equilibrium exchange rates obtained from the alternative methods.

Figure:– 4.4

Alternative Exchange Rates



Alternative equilibrium exchange rates along with the official exchange rate and the SEM exchange rate (WES) are shown in Table-4.7. To facilitate comparison with the equilibrium exchange rates calculated using the elasticity approach, the equilibrium RER calculated using the omega approach is expressed as a nominal exchange rate in Table-4.7. If the price of nontradables is unchanged through adjustment of monetary policy, the calculated percentage change in the real exchange rate is equal to the percentage change in the nominal exchange rate (Dorosh and Valdes,1990). Figure 4.4 depicts the intertemporal behavior of the equilibrium exchange rates obtained from the alternative methods.

Movements of the equilibrium exchange rates using both approaches are similar. As expected, the equilibrium exchange rate using the omega parameter, E^*_0 and that using the elasticity approach assuming that the observed current account deficit is sustainable in the long run, i.e., E^*_2 are much closer than E^*_0 and E^*_1, which assumes free trade and equilibrium in the current account. The secondary market exchange rate, WES was in general closer to the equilibrium exchange rate based on the omega approach. The WES rate, is not available before 1977/78 because scheme was not in existence prior to this year. It was closest to E^*_2, on average in the last 5-year period shown in Table-4.7. The misalignment of the WES rate decreased to nearly zero in 1981/82 but then increased very significantly in the next two years. The WES rate, however, was above the equilibrium exchange rate, E^*_2 upto 1981/82 and again in 1984/85.

Table-4.7

Comparison among Official, Wage Earners and Equilibrium Exchange Rate

Year	(1) OER	(2) WES Rate	(3) E_0	(4) E_1	(5) E_2	(6) ((1-3)/3)*100	(7) ((1-5)/5)*100	(8) ((2-3)/3)*100	(9) ((2-5)/5)*100
1973-74	7.966		11.195	15.396	12.211	-28.263	-34.758		
1974-75	8.875		10.701	16.512	12.961	-17.063	-31.523		
1975-76	15.054		17.032	22.969	18.367	-11.612	-18.055		
1976-77	15.426		17.292	24.295	19.723	-10.796	-21.808		
1977-78	15.117	19.860	16.592	24.648	19.446	-8.892	-22.264	19.695	2.127
1978-79	15.223	19.660	16.359	22.214	17.629	-6.944	-14.617	20.300	10.360
1979-80	15.490	19.210	18.469	23.955	18.838	-16.123	-17.774	4.013	1.973
1980-81	16.259	20.110	19.977	24.546	19.761	-14.326	-17.723	5.969	1.757
1981-82	20.165	22.790	22.608	29.954	23.983	-11.248	-16.336	0.805	-4.974
1982-83	23.795	24.120	26.147	32.116	28.373	-15.460	-16.134	-14.306	-14.969
1983-84	24.944	27.160	30.506	36.051	31.704	-18.240	-21.324	-10.975	-14.334
1984-85	25.963	29.350	28.907	40.804	33.599	-10.184	-22.725	1.636	-12.556
1985-86	29.886	32.740	33.413	40.122	35.128	-10.555	-14.922	-2.013	-6.798
1986-87	30.629	33.060	33.964	37.902	33.947	-9.817	-9.773	-2.682	-2.555
1987-88	31.242	32.940	35.318	41.044	35.920	-11.541	-13.022	-6.734	-8.296
1988-89	32.142	32.910	35.358	41.012	36.030	-9.094	-10.790	-6.923	-8.659
1989-90	32.921	33.580	34.918	43.325	37.097	-5.717	-11.256	-3.831	-9.481
1990-91	35.590	36.380	37.677	48.998	39.742	-5.574	-10.196	-3.443	-8.460
Avg. 73-74 75-76	10.6319		12.9460	18.2923	14.8428	-18.9732	-28.5454		
Avg. 76-77 80-81	15.5039	19.7150	17.5378	23.9316	19.1207	-11.4162	-18.8375	12.4942	4.0615
Avg. 81-82 85-86	24.9307	27.2380	28.7166	35.8157	30.5574	-13.1371	-18.2881	-4.9709	-10.7302
Avg. 86-87 90-91	32.5251	33.7780	35.4470	42.2762	36.5472	-8.2668	-11.0075	-4.7066	-7.4900

Source:
(1), (2): Economic Trends, Bangladesh Bank (Various issues)
(3) : See Appendix Supplementary Table-3.
(4), (5): See Table 4.6.

Note:
WES exchange rate is the secondary foreign exchange market rate. The rate was not available before 1977/78 since the scheme was not in existence prior to this year.

The official exchange rate was consistently overvalued. The overvaluation of the exchange rate however, decreased overtime. Trade liberalization since 1988/89 has, therefore, reduced the exchange rate misalignment.

Section Five

Measuring the Impact of Policies on Economic Incentives

5.1 Analytical Framework

5.1.1 Direct Effects of Trade and Pricing Policies on Output Prices

The basic analytical approach of this study follows that of Krueger, Schiff and Valdes (1988). Border prices are commonly used as reference prices in measuring the impact of direct price interventions or sector-specific pricing policies on the assumption that most agricultural commodities are traded goods, i.e., exportables or import-substituting goods and the share of individual trading countries in world trade is negligible, i.e., they are price takers in the world markets. However, border prices must be adjusted for marketing costs which include handling, transport, storage costs, quality differentials and other factors. In unregulated markets, therefore, the producer price for exportables would be related to the border prices as follows:

$$P_i = P^W_i \, E_o \, (1-t_i) - C_i \qquad \ldots \qquad \ldots \qquad (1)$$

where, P_i = denote producer price, P^W_i = world price at border (f.o.b.) in foreign currency, E_o = nominal official exchange rate, t_i = export tax or subsidy depending on whether $t_i \gtrless 0$, and C_i = adjustment for differences in quality, location (transport), time (storage) and other marketing costs. The export tax may be explicit or implicit when export quotas exist or when output is procured below market prices, etc.

When there is no intervention in the market, the producer price bears the following relationship to the border price:

$$P_i = P^W_i E_o - C_i \quad \ldots \quad \ldots \quad (2)$$

where C_i represents all components of the marketing margin as in C above but is now measured under free-trade conditions.

For importables the relationship between domestic producer price and the world border price would be:

$$P_j = P^W_j E_o (1+t_j) + C'_{md} - C'_{jd} \quad \ldots \quad \ldots \quad (3)$$

and in the absence of direct intervention:

$$P'_j = P^W_j E_o + C'_{jm} - C_{jd} \quad \ldots \quad \ldots \quad (4)$$

where, P^W = foreign currency border (c.i.f) price, C'_{jm} represents the marketing margin from the port of entry to the wholesale market and C'_{jd} represents the components of the marketing spread between the wholesale market to the farmgate.

Though explicit tax and subsidy rates exist the nominal protection rate may differ from those rates due to the existence of concessions, quantitative restrictions, etc. It is, therefore, of interest to compute the implicit nominal protection rates t_i and t_j through direct price comparisons. The

hypothetical free trade prices P'_i and P'_j have to be computed from the border prices P^W_i, P^W_j after adjustment for C'_i and C'_j. The adjustment yields border (export and import) parity prices which may be compared to the domestic prices at various points in the marketing chain. e.g. wholesale market, millgate, farmgate, etc.

The nominal rate of protection (NRP) measures the direct effect of agricultural trade and output price policies including trade taxes, quotas, marketing and processing subsidies, price supports and government monopolies on trade if any, etc. on output price. The NRP of agricultural commodity, i, is given by:

$$NRP = \frac{P_i/P_{na} - P'_i/P_{na}}{P'_i/P_{na}} = \frac{P_i - P'_i}{P'_i} = \frac{P_i}{P'_i} - 1 \quad \ldots \quad (5)$$

The NRP on good i, therefore, measures the direct effects of trade and pricing policies on output price by comparing actual domestic prices with free-trade prices that would prevail in the absence of government intervention. P_{na} represents the non-agricultural price index.

Trad policies affecting the nonagricultural sector and real exchange rate poli ies affect agricultural prices relative to nonagricultural prices, i.e., P_i P_{na}. The nonagricultural price index consists of a traded and non-traded compcnent:

$$P_{na} = \alpha P_{nat} + (1-\alpha) P_{nah} \quad \ldots \quad \ldots \quad (6)$$

where P_{nat} and P_{nah} are the price indices of traded and non-traded non-agricultural commodities respectively.

5.1.2 Indirect and Total Effects of Policy Interventions

The indirect nominal protection rate is given by:

$$NPR_I = \frac{P_i'/P_{na}}{P^*_i/P^*_{na}} - 1 = \frac{P_i'/P_{na}}{(E^*/E_o)P_i/P^*_{na}} - 1 = \frac{E_o}{E^*} \cdot \frac{P^*_{na}}{P_{na}} - 1 \quad \ldots(7)$$

P^*_i and P^*_{na} represent the free trade equilibrium values of P_i and P_{na} evaluated at the equilibrium exchange rate. The indirect nominal protection rate measures the effect of misalignment of the exchange rate E_o from E^*, and the effects of trade policies (protection) on P_{nat}, i.e., the tradable component of the non-agricultural price index and hence, appreciation of the real exchange rate. The NPR_I represents economy-wide effects. It is common to all tradable agricultural commodities and does not pertain to the individual commodity under consideration.

The total nominal rate of protection may be defined as follows:

$$NPR_T = \frac{P_i/P_{na}}{P^*_i/P^*_{na}} - 1 \quad \ldots \quad \ldots \quad (8)$$

Thus, NPR_T measures the combined affects of sectoral and economy-wide price, trade and exchange rate interventions on agricultural commodities. The total effect on output prices is therefore, the NRP adjusted for sectoral and

economywide policies (Dorosh and Valdes 1990). Since, the denominator of NRP as stated in equation (1) above is different from that of NPR_I and NPR_T, the sum of NRP and NPR_I does not yield NPR_T. To make these measures comparable and additive, the definition of NRP may be modified as follows:

$$NPR_D = \frac{P_i/P_{na} - P_i'/P_{na}}{P^*_i/P^*_{na}} \quad \ldots \quad \ldots \quad (9)$$

which measures the impact of direct output price and trade policies as a percentage of the relative price that would prevail in a free trade regime and an equilibrium exchange rate.

5.2. Estimates of the Effects of Trade and Exchange Rate Policies on Output Prices

Estimates of the direct effect or nominal rates of protection and indirect effects of trade and exchange rate policies on prices of agricultural commodities presented in this section. International reference prices, i.e., world prices are either import parity or export parity prices depending on whether the commodity is an importable or exportable. However, when the share of import or export was 10% or less of total production, the average of the two parity prices have been used as the reference price. Producer prices are annual average farmgate prices. Appendix-1 contains details of the computations.

5.2.1 Rice

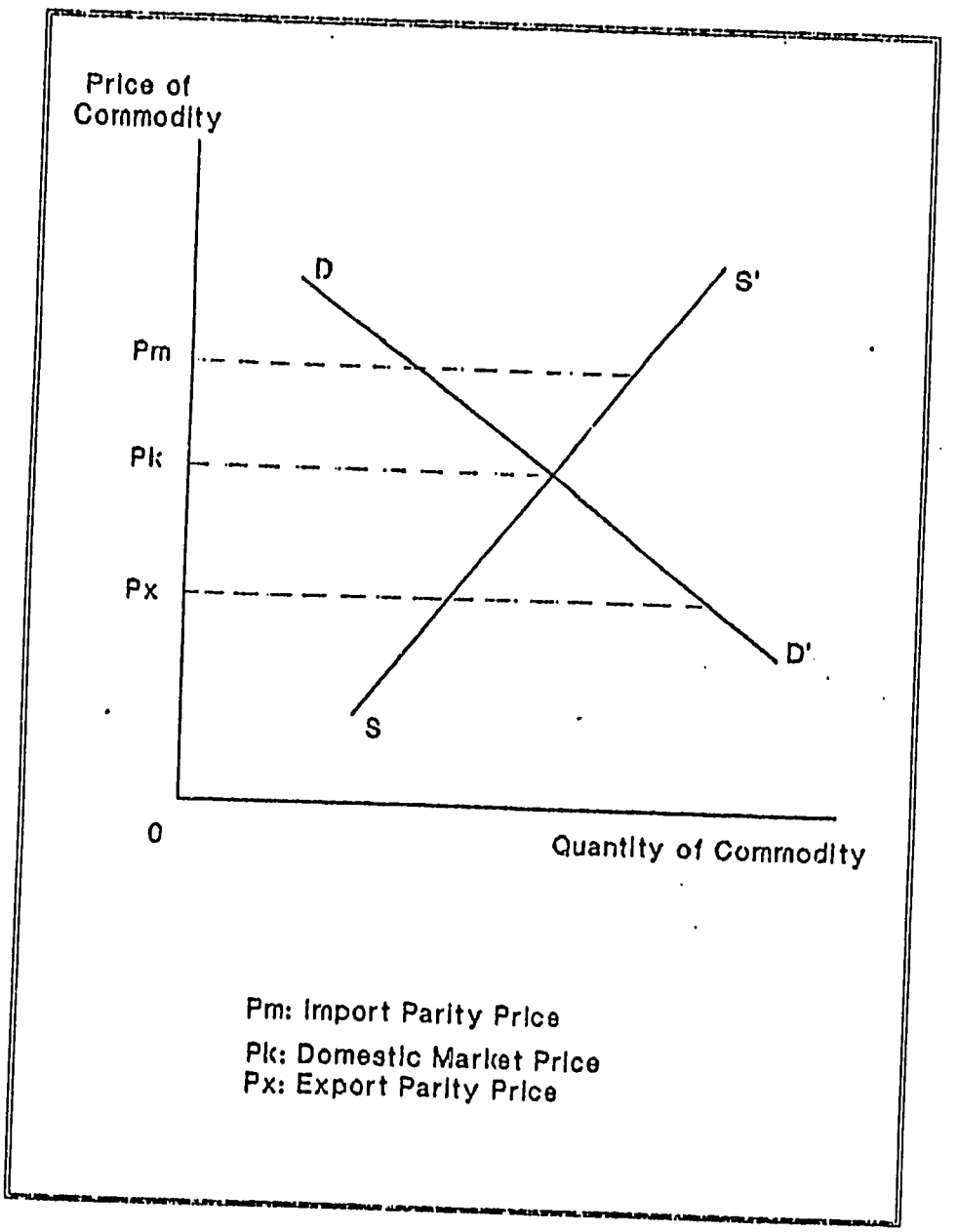
It is somewhat difficult to arrive at a reference price for rice due to quality differences between internationally traded rice and domestically produced rice in Bangladesh. The great bulk of the rice produced in Bangladesh, i.e., the coarse variety is of a relatively low quality. In determining a comparable internationally traded grade of rice, we relied on assessments of private traders. Discussions with traders suggested that Bangladeshi coarse rice is markedly superior to the internationally traded 25% broken Thai variety, i.e., there is a strong consumer preference for the domestic coarse rice. Traders also suggested that the mainly 15% broken Thai rice imported through the public international procurement system is also inferior to domestic coarse rice and would not be imported by the private sector in a free trade regime. However, an IFPRI rice market survey (1992) has shown that domestic aman coarse rice mainly consists of 14% broken. We have, therefore, chosen the Thai 15% broken rice as the reference grade for comparison with domestic coarse rice. Since, the international price of 15% broken Thai rice was not available, the average of 5% broken and 25% broken Thai rice was used to represent the price of 15% broken Thai rice in the present study. This may be viewed as a downward quality adjustment on the 5% broken Thai rice to make it comparable to domestic coarse rice.

Bangladesh has been a marginal rice importer, the import parity price thus, appears to be the relevant world reference price. The nominal rate of

protection is significantly negative at the import parity price. Out of the 18 years for which protection rates are shown in Table 5.1, the NRP was negative in 13 years. The year 1974/75 was a famine year in Bangladesh. This is reflected in the large 75% increase in domestic price in that year over the previous year. Excluding this year as an abnormal year yields an average NRP of -26.5% which reflects the nominal protection to rice more accurately in the period 1973/74-1975/76. The direct effect of trade and agricultural price policies on rice price, at -26.3% was highest in the period 1976/77-1980/81. However, mainly due to lower world rice prices in the period 1981/82-1985/86, average direct nominal protection was virtually zero. A sharp increase in domestic producer price in 1986/87 resulted in an direct NRP of 15%, the highest excluding 1974/75. The direct effect of trade and price policies, however, has been consistently and significantly negative since then. Average nominal protection from 1986/87-1990/91 was -10.3%.

Including the indirect effects of economywide exchange rate policies and trade policies in the manufacturing sector yields much lower nominal protection rate, i.e., the direct effect is accentuated when protection is negative and reduced when protection is positive when the indirect effects are included. Thus, the total effect of trade and exchange rate policies was to depress the domestic price of rice below its corresponding free trade equilibrium border prices by between 15%-19% in the 1980s and between 19%-39% in the 1970s.

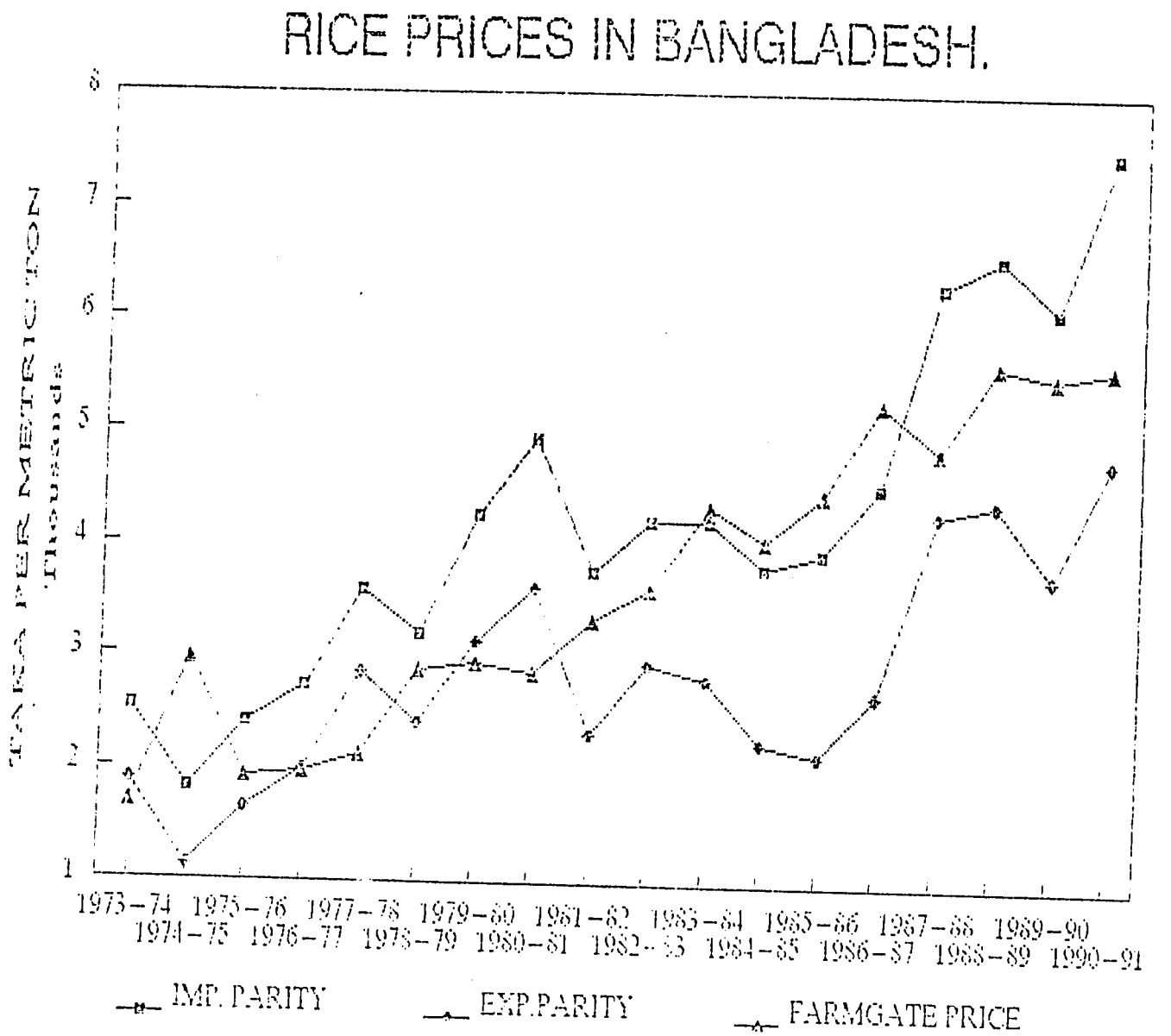
Figure 5.1


Price of
Commodity
D
S'
Pm
Pk
Px
D'
S
0
Quantity of Commodity
Pm: Import Parity Price
Pk: Domestic Market Price
Px: Export Parity Price

A recent study by the World Bank uses an f.o.b. Thailand price of rice of only US $150/metric ton (World Bank 1991). Such a low price compares with the price of Thai A1 super grade, a vastly inferior grade of rice compared even to the Thai 25% broken rice. Such a low reference price would of course suggest that domestic rice production was being protected and that trade liberalization would result in a decline in the domestic price clearly establishing rice as an importable. On the supply side, a decline in the relative price of rice would induce diversification away from rice. However, this result depends critically on the assumed reference price. A price of US$150/per tonne is unrealistically low. Any f.o.b. price below US$250 per tonne appears to be unrealistic. At this f.o.b. price the border parity price would still indicate negative protection.

Using the import parity price as the reference price assumes that incremental rice production will substitute for imports. Since, imports comprise a very small proportion of total rice production i.e., only 2% as shown earlier, the export parity price was also computed since, the country could be a rice exporter in any given year simply due to weather-induced supply fluctuations. However, with wheat production declining in the 1980s, incremental rice production would substitute for foodgrain imports. Interestingly, the domestic price has always been between the import and export parity prices as shown in Figure 5.1. In other words, rice would be imported at the export parity price and exported at the import parity price. Thus, in free trade equilibrium the market clearing price would lie between the import and export parity price.

Figure 5.2



The width of the band given by the two parity prices is also very large implying that rice is effectively a non-traded good and hence, trade liberalization will not alter domestic prices. However, in these cases the average of the two border parity prices has often been used as an approximation of the free trade equilibrium price.

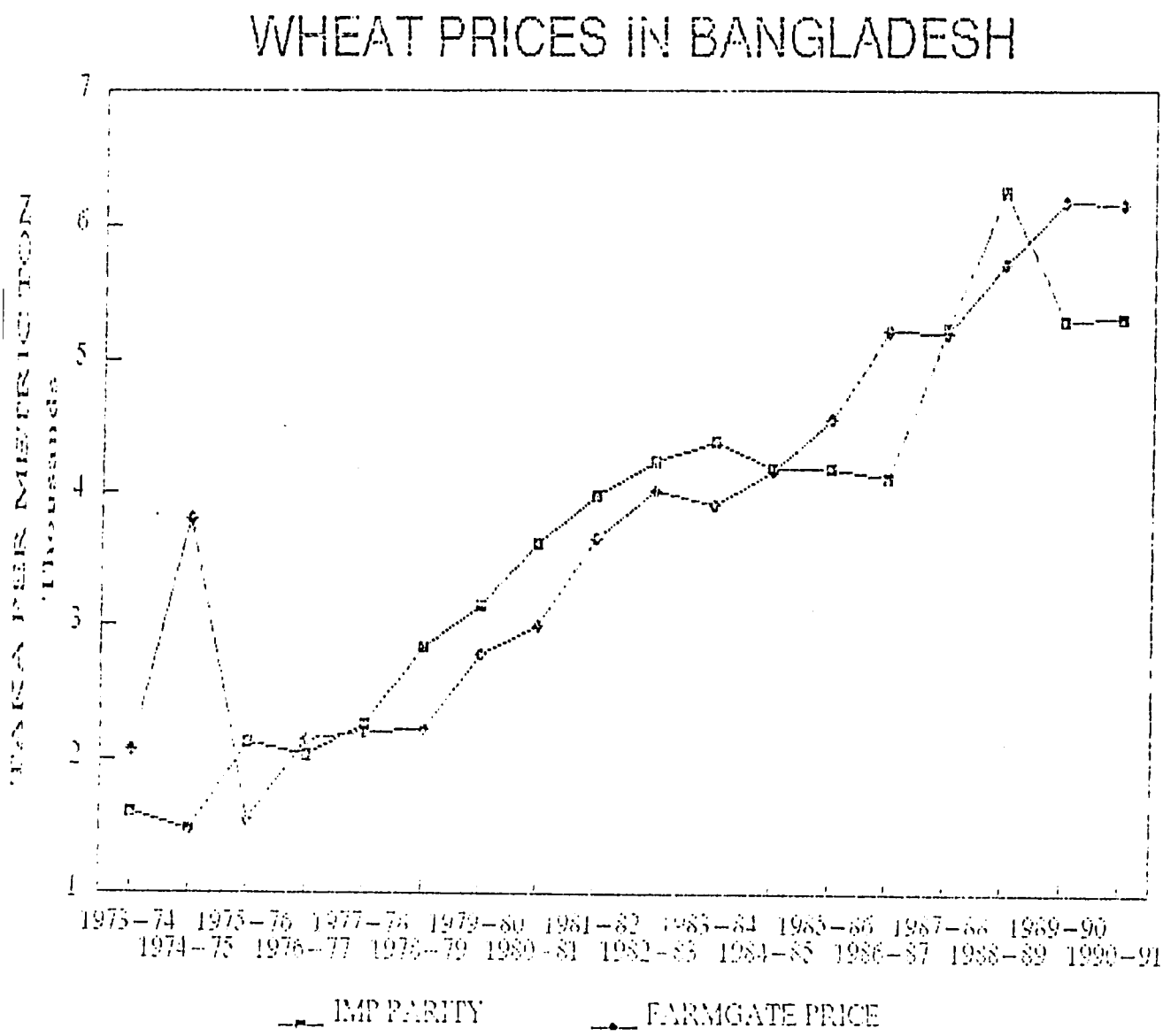
Using the average of the import and export parity price as the world price that would prevail under free trade, the average direct effect of trade and agricultural price policies in the most-recent five year period, i.e., 1986/87-1990/91 was estimated at 7.6%. However, including the indirect effects of appreciation of the real exchange rate alters the direction of the nominal protection rate yielding a total nominal protection of -2.5% in the 1980s. Thus, rice production has been implicitly taxed by indirect policy interventions aimed at exchange rate management and protection to the non-agriculture sector. Domestic real paddy prices received by farmers were, therefore, 97.5% of their corresponding free trade equilibrium real prices on average between 1986/87-1990/91.

5.2.2 Wheat

The foodgrain deficit of the country has historically been made up mainly through wheat imports. Wheat is clearly an importable and domestic production substitutes for imports. The government has operated a procurement program since 1975/76 to purchase wheat from farmers for distribution through

the food rationing system. However, as stated earlier the program has not been large enough to determine the grower level prices. Instead market demand and supply appear to have determined wheat prices in the country. Thus, farmgate prices have been used as the domestic producer prices, while, the US hard winter wheat price has been used as the world wheat price. The Canadian Red Spring wheat price has been significantly higher in the period under consideration in this study and is, therefore, less likely to be imported in a free trade regime. The direct effect of price and trade policies on wheat prices received by farmers has declined over time reflecting a greater increase in domestic prices compared to world prices. It was -8.3% from 1976/77-1980/81, -2.6% from 1981/82-1985/86 and then turned positive, i.e., 9.3% on average from 1986/87-1990/91. Out of the 18 years for which the analysis was undertaken the direct effect was negative in 11 years while, it was positive only in 7 years. Thus, the border parity price of wheat at farmgate measured at the official exchange rate has mostly remained above the domestic producer price. Including the indirect effects of economywide exchange rate and commercial policies yields significantly negative total nominal protection in all but 3 years. The total nominal protection rate for wheat declined sharply from -21% to in 1981/82-1985/86 to -0.3% in 1986/87-1990/91.

Figure 5.3



5.2.3 Oilseeds and Edible Oil

Edible oil and oilseeds are among the largest imports of Bangladesh. Mustard seed is the major variety of oilseed produced in Bangladesh. Consequently mustard oil extracted from this oil seed variety is the major edible oil produced in the country. However, only rape seed and rape seed oil, a close substitute of mustard seed and oil are internationally traded. Bangladesh imports both rape seed and rape seed oil. Thus, edible oil producers may either use imported seeds or domestically produced oil seeds in the local oil mills. The direct and total nominal protection for domestic mustard seed and oil was computed using the international prices of rape seed and rape seed oil as the reference prices. Oilseed production in Bangladesh has been highly protected with a direct nominal protection rate of 91% in the most recent five-year period viz. 1986/87-1990/91. Thus, the border parity price at farmgate was only half the domestic producer price in this period. The direct effect was however between 20%-30% on average from 1976/77-1985/86. The indirect effects of economywide exchange rate and commercial policies were negative and hence, reduced the protection rate very significantly. Including these effects yielded an average total nominal protection rate of 80.6% in the 5-year period from 1986/87-1990/91.

Figure 5.4

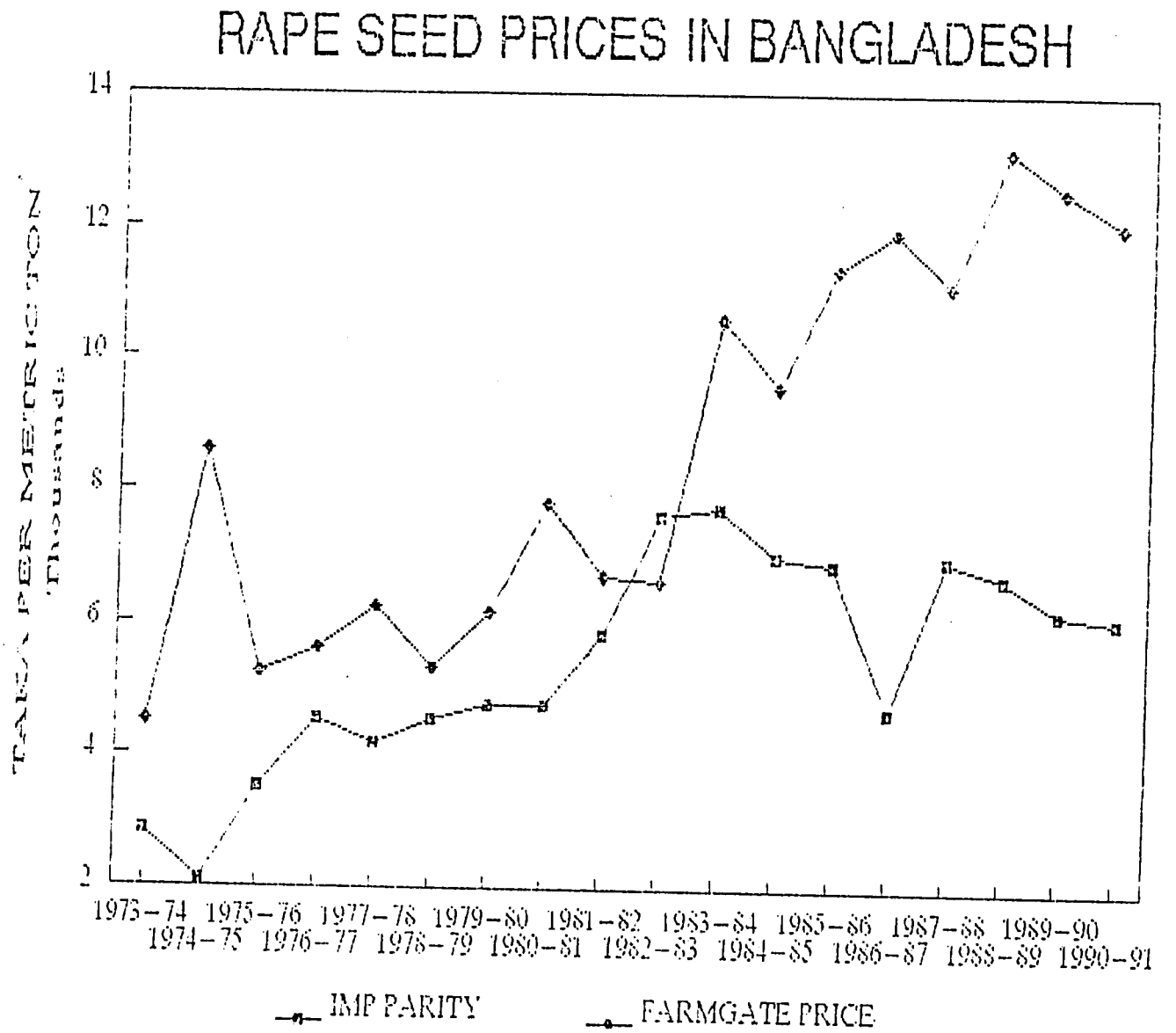
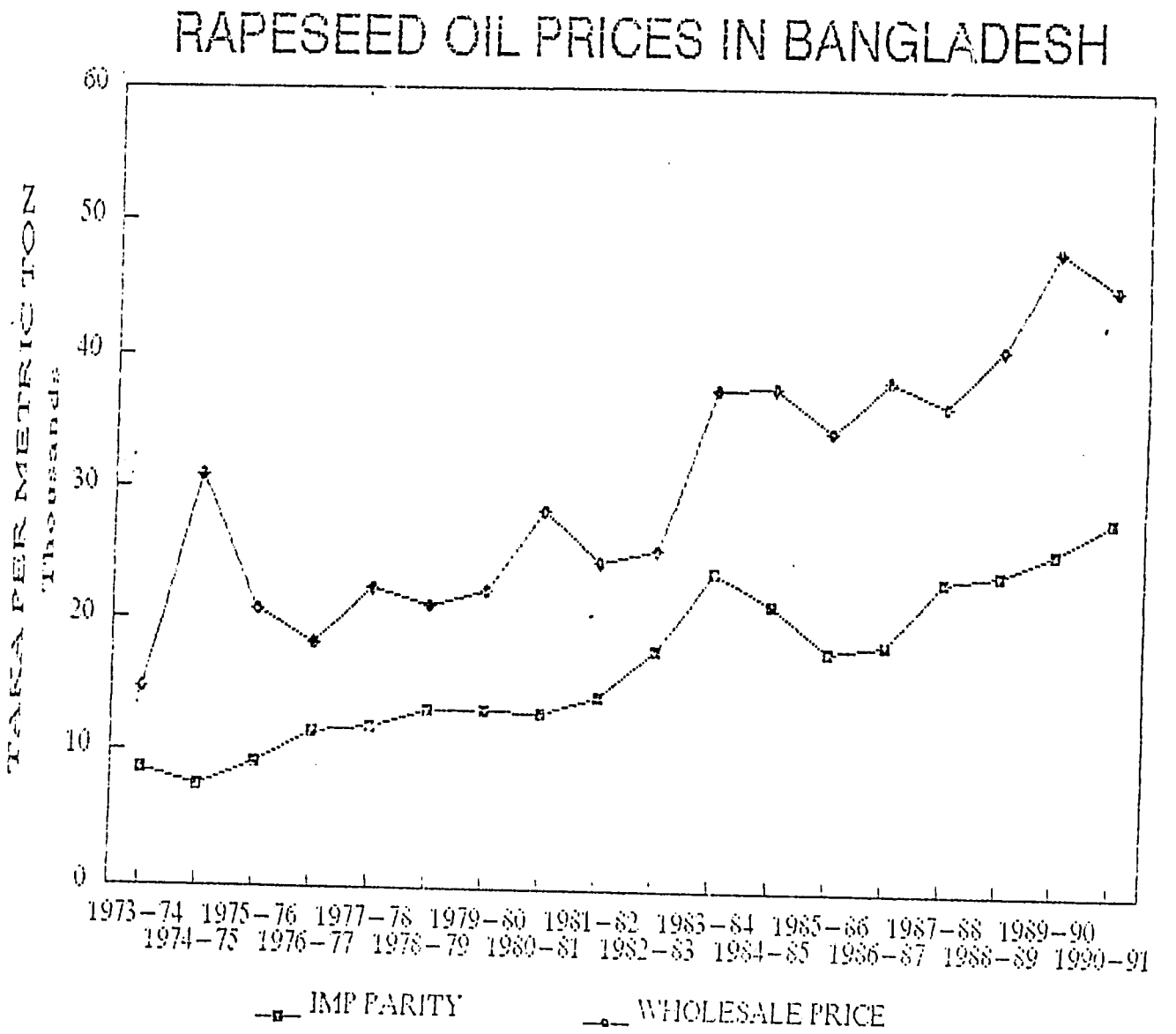


Figure 5.5

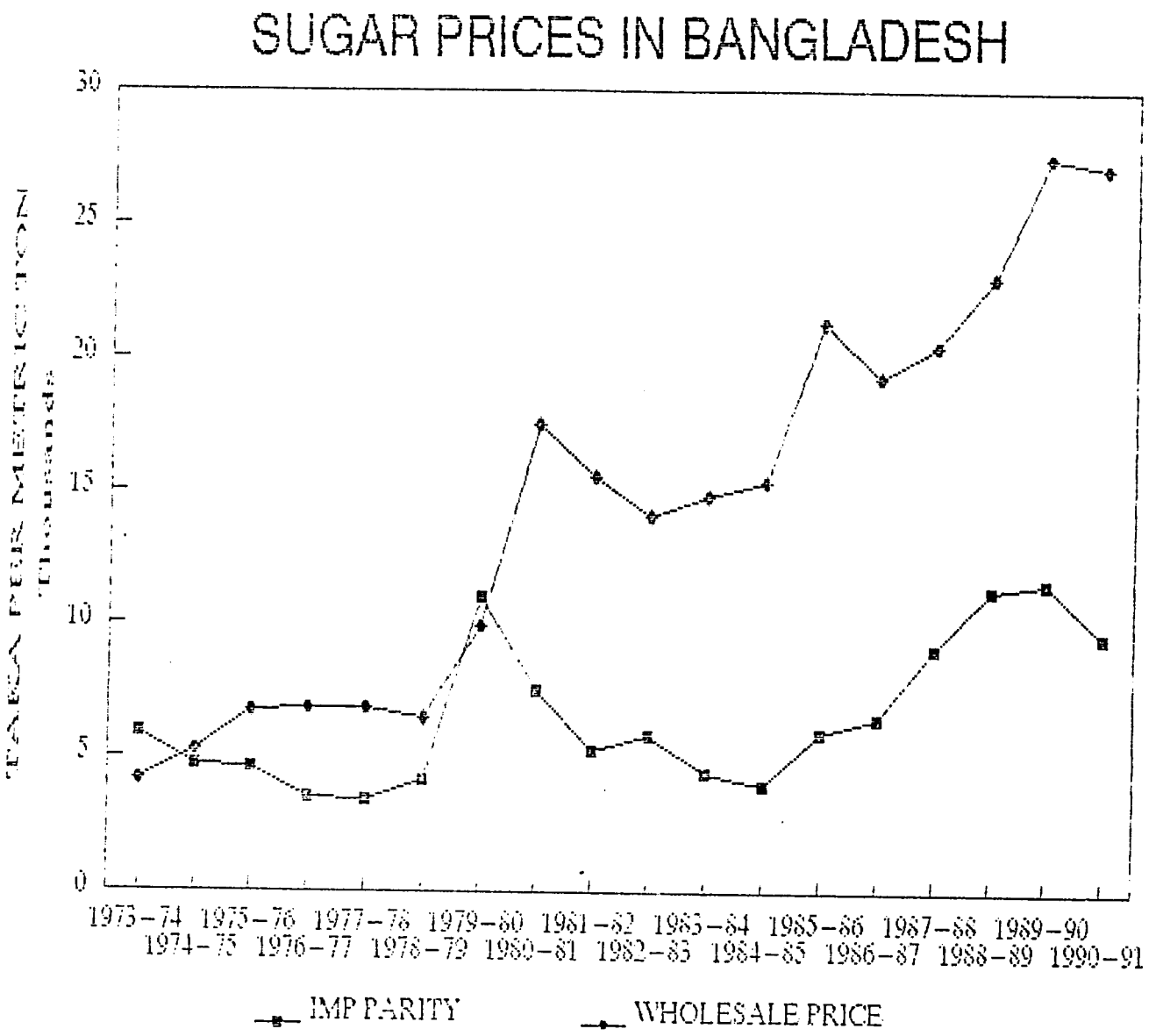


The direct effect of agricultural price and trade policies pertaining to edible oil production was to keep the domestic wholesale price of mustard oil 73.7% above its border price measured at wholesale on average from 1986/87-1990/91. Including the indirect effects decreases the average nominal protection level to 68.1%.

5.2.4 Sugar/Sugarcane

The direct effect of government policies resulted in extremely high rates of direct nominal protection to sugar. The average direct effect at 197.5% was highest from 1981/82-1985/86 and declined to an average of 139% in the period 1986/87-1990/91. Though, there is great variability in the world sugar price nominal protection to sugar has been consistently high except in two years, i.e., 1973/74 and 1979/80 when the highest world sugar prices were observed. But the negative signs in the rate of direct protection in 1984/85 requires interpretation. A low world price in that year yields a negative border parity price for sugarcane at farmgate. The negative sign is therefore due to the denominator. The direct nominal protection rate in 1984/85 should thus, be treated as being *infinitely* high . World sugarcane prices were computed by making adjustments for milling costs, extraction rates, etc. Details of the calculations are given in Appendix-1. The direct protection provided to sugarcane in the five year period from 1986/87-1990/91 was 608.1%. The variability of world sugar prices is reflected in the implicit protection rates to sugarcane production. Thus, the direct nominal protection rates were

Figure 5.6



from 1981/82-1985/86, 58% from 1976/77-1980/81 and 3% prior to 1976/77, on average. Including the indirect effects shows that, in the most recent five years shown in Table 5.1, domestic wholesale sugar prices and farmgate sugarcane prices were 131% and 564.2% above their free-trade equilibrium border parity prices.

5.2.5 Cotton

Bangladesh mostly imports cotton with staple lengths of 1-1/32 and 1-1/16. Domestically produced cotton is superior to the imported grades. The international price of cotton with a staple length of 1-1/16 was used as the international reference price. However, no quality adjustment was made. The import parity price of cotton at farmgate was above the domestic farmgate price in 13 out of the 18 years shown in Table 5.1. Upto 1984/85 direct nominal protection was negative in each year ranging from -48% to -76%. Since then it was negative only in 1990/91. The direct nominal rate of protection was only 4.2% on average between 1986/87 and 1990/91. However, the effect of economywide exchange rate and commercial policies offset the direct protection resulting in a total nominal protection rate of -5.8%. Thus, the domestic real farmgate cotton price was 94.2% of the free trade equilibrium real border price of cotton measured at farmgate on average in the 5-year period ending in 1990/91. In interpreting the results for cotton shown in Table 5.1, it is important to note that since the cotton textile sector was almost completely state-owned a low procurement price was fixed (administered pricing) for raw

Figure 5.7

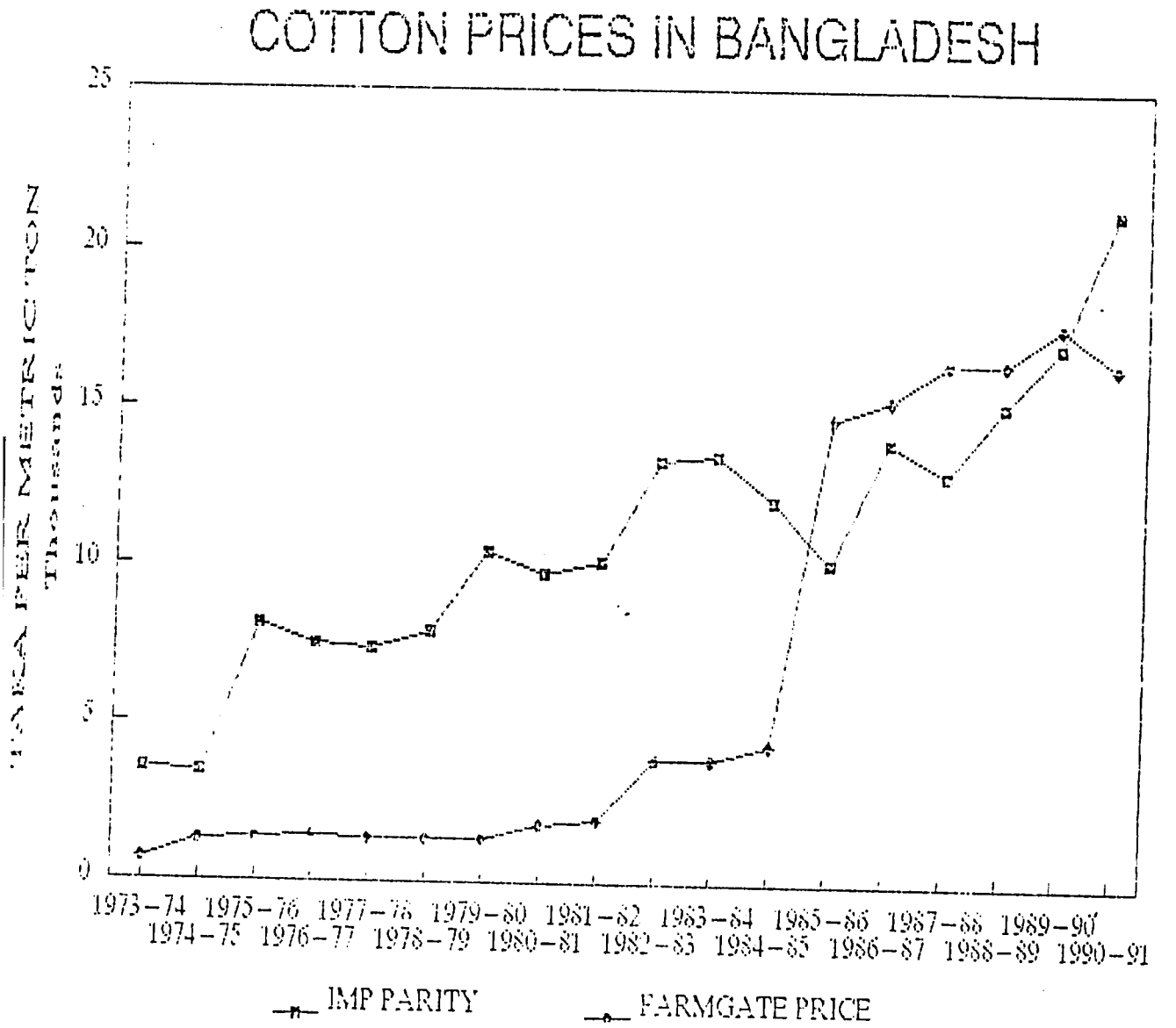


Table 5.1

Direct and Total Nominal Protection Rates to Producers of Agricultural Commodities in Bangladesh

		Average			
		1973-74 to 1975-76	1976-77 to 1980-81	1981-82 to 1985-86	1986-87 to 1990-91
Rice 15% Import Parity	NRP	0.035	-0.304	-0.007	-0.113
	NPR D	0.036	-0.263	-0.005	-0.103
	NPR T	-0.187	-0.389	-0.149	-0.194
Rice 15% Export Parity	NRP	0.563	-0.067	0.618	0.402
	NPR D	0.427	-0.054	0.510	0.351
	NPR T	0.167	-0.199	0.328	0.233
Rice 15% Avg. Parity	NRP	0.244	-0.203	0.229	0.086
	NPR D	0.196	-0.173	0.194	0.076
	NPR T	-0.042	-0.307	0.035	-0.025
Wheat USA Import Parity	NRP	0.529	-0.095	-0.032	0.101
	NPR D	0.394	-0.083	-0.026	0.093
	NPR T	0.167	-0.210	-0.170	0.003
Rapeseed Oil Import Parity	NRP	1.655	0.790	0.690	0.781
	NPR D	1.397	0.714	0.624	0.737
	NPR T	1.222	0.620	0.522	0.681
Rape Seed Import Parity	NRP	1.371	0.366	0.278	1.014
	NPR D	1.029	0.314	0.238	0.910
	NPR T	0.783	0.177	0.085	0.806
Sugar Import Parity	NRP	0.089	0.748	2.237	1.500
	NPR D	0.094	0.666	1.975	1.390
	NPR T	-0.113	0.552	1.854	1.313
Sugarcame Import Parity	NRP	0.027	0.982	18.568	27.983
	NPR D	0.046	0.779	3.688	6.081
	NPR T	-0.236	0.569	3.113	5.642
Cotton Import Parity	NRP	-0.748	-0.823	-0.483	0.051
	NPR D	-0.575	-0.716	-0.405	0.042
	NPR T	-0.806	-0.845	-0.555	-0.058
Lentils Import Parity	NRP		-0.425	-0.255	-0.096
	NPR D		-0.370	-0.220	-0.090
	NPR T		-0.498	-0.367	-0.184
Potato Export Parity	NRP	-46.439	8.633	2.699	1.707
	NPR D	29.438	4.705	1.733	1.343
	NPR T	27.171	4.373	1.440	1.161
Potato Import Parity	NRP	0.310	-0.262	-0.428	-0.333
	NPR D	0.233	-0.224	-0.370	-0.308
	NPR T	0.016	-0.345	-0.507	-0.393

Table 5.1 (Continued)

		AVERAGE			
		1973-74 TO 1975-76	1976-77 TO 1980-81	1981-82 TO 1985-86	1986-87 TO 1990-91
Potato Avg. Parity	NRP	1.653	0.298	-0.054	0.053
	NPR D	1.156	0.267	-0.043	0.042
	NPR T	0.883	0.119	-0.207	-0.064
Jute Export Parity	NRP	-0.194	-0.219	-0.210	-0.308
	NPR D	-0.151	-0.188	-0.178	-0.277
	NPR T	-0.414	-0.336	-0.344	-0.387
Dry Chillies Import Parity	NRP	0.783	0.052	0.291	0.409
	NPR D	0.584	0.038	0.225	0.370
	NPR T	0.358	-0.089	0.081	0.280
Onion Import Parity	NRP	0.441	0.057	0.036	0.031
	NPR D	0.349	0.046	0.044	0.022
	NPR T	0.151	-0.071	-0.090	-0.062
Tea Export Parity	NRP	0.717	-0.103	-0.228	-0.170
	NPR D	0.485	-0.088	-0.187	-0.155
	NPR T	0.221	-0.228	-0.344	-0.261
Total Agriculture	NRP	0.1136	-0.1965	-0.0369	-0.0967
	NPR D	0.0900	-0.1756	-0.0308	-0.0889
	NPR T	-0.1368	-0.3076	-0.1763	-0.1814

Source: Own Calculations.

Note:1. Total agriculture is a weighted average of nominal rates of protection of importables and exportables. The weights are the relative value shares of production:

WEIGHTS (%)	1974-76	1977-81	1982-86	1987-90
Rice	81	78	75	79
Wheat	1	3	8	5
Masur	1	2	1	2
Rape & Masturd	4	4	3	2
Onion	1	1	1	1
Chillies	2	2	1	1
Jute	5	8	8	5
Cotton	0.003	0.004	0.05	0.06
Tea	1	2	1	1
Potato	4	3	3	4

Nominal protection rates for sugarcane are excessively large owing to very large processing margins in the parity price calculations. Including sugarcane (weight 4.5%) gives a misleading picture of the incentive structure in agriculture as a whole. Sugarcane is, thus excluded in the weighted average nominal protection rate computed for the agriculture sector.

Note:2. Since $NPR_I = NPR_T - NPR_D$, the estimates of NPR_I are not reported seperately.

cotton at which the BTMC purchased cotton from farmers. After privatization administered pricing was withdrawn in 1985/86. Thus, the average direct nominal protection rate was -64.3% from 1973/74-1984/85, i.e. the administered pricing period, but, increased sharply to 11.5% from 1985/86-1990/91.

5.2.6 Pulses

Masur and *Khesari* are the most important pulse varieties produced and consumed in Bangladesh. However, internationally traded Turkish lentils is closely comparable only to masur. Turkish prices of lentils were therefore, used in the parity price calculations. Protection accorded to *masur* through direct policy interventions has been consistently negative except in 1987/88 but, appears to have increased over time. It increased from an average of -37% in 1976/77-1980/81 to -22% in 1981/82-1985/86 and then further to -9% in 1986/87-1990/91. However, the domestic farmgate prices were only 81.6% of the corresponding free trade equilibrium border prices of lentils on average, in 1986/87-1990/91 as implied by the total nominal protection rate of -18.4%.

5.2.7 Potato

Bangladesh is self-sufficient in potato production. However, due to large production instability induced mainly by weather shifts, periods of scarcity and surplus arise altering the potential trade status of the country

Figure 5.8

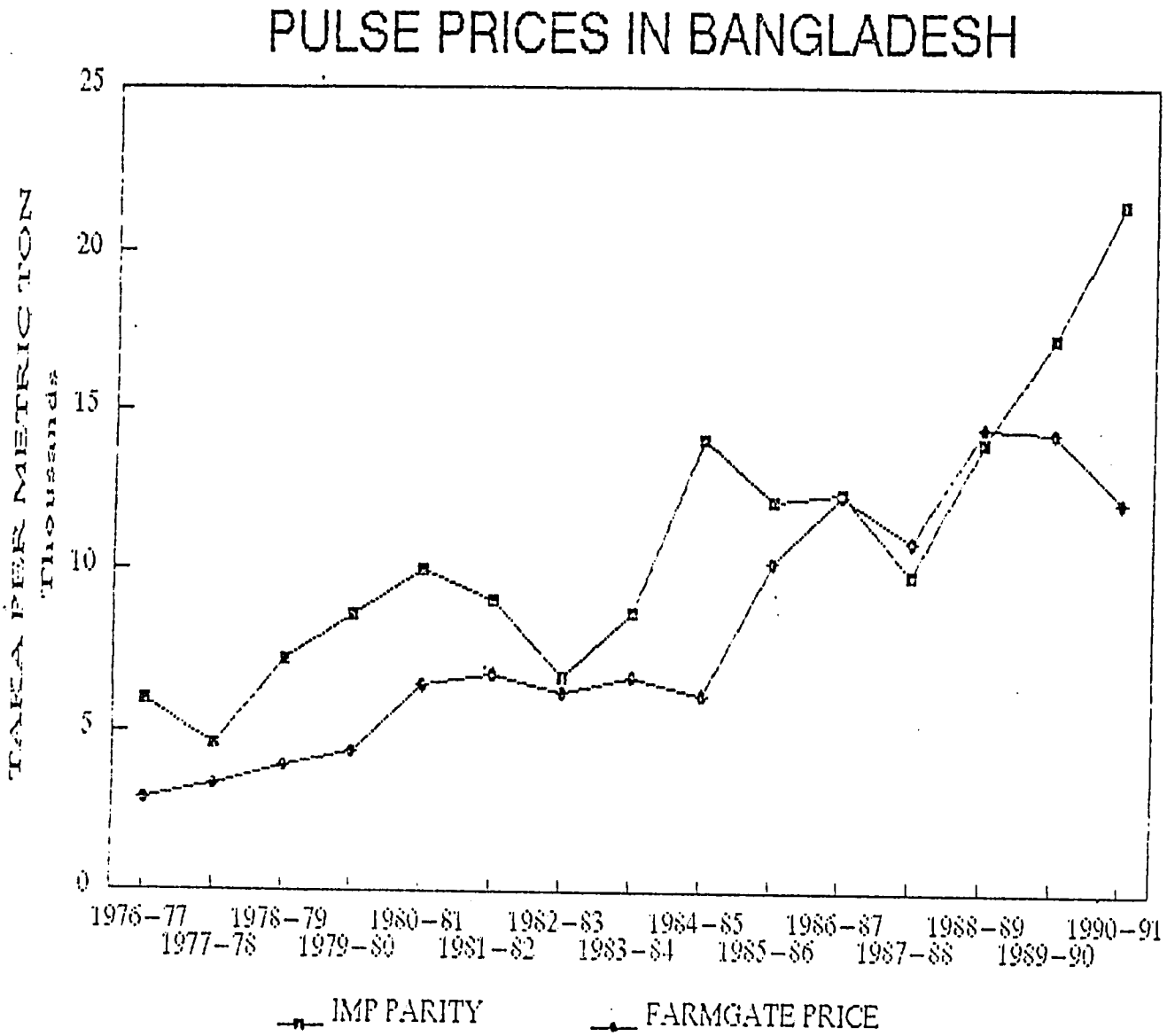
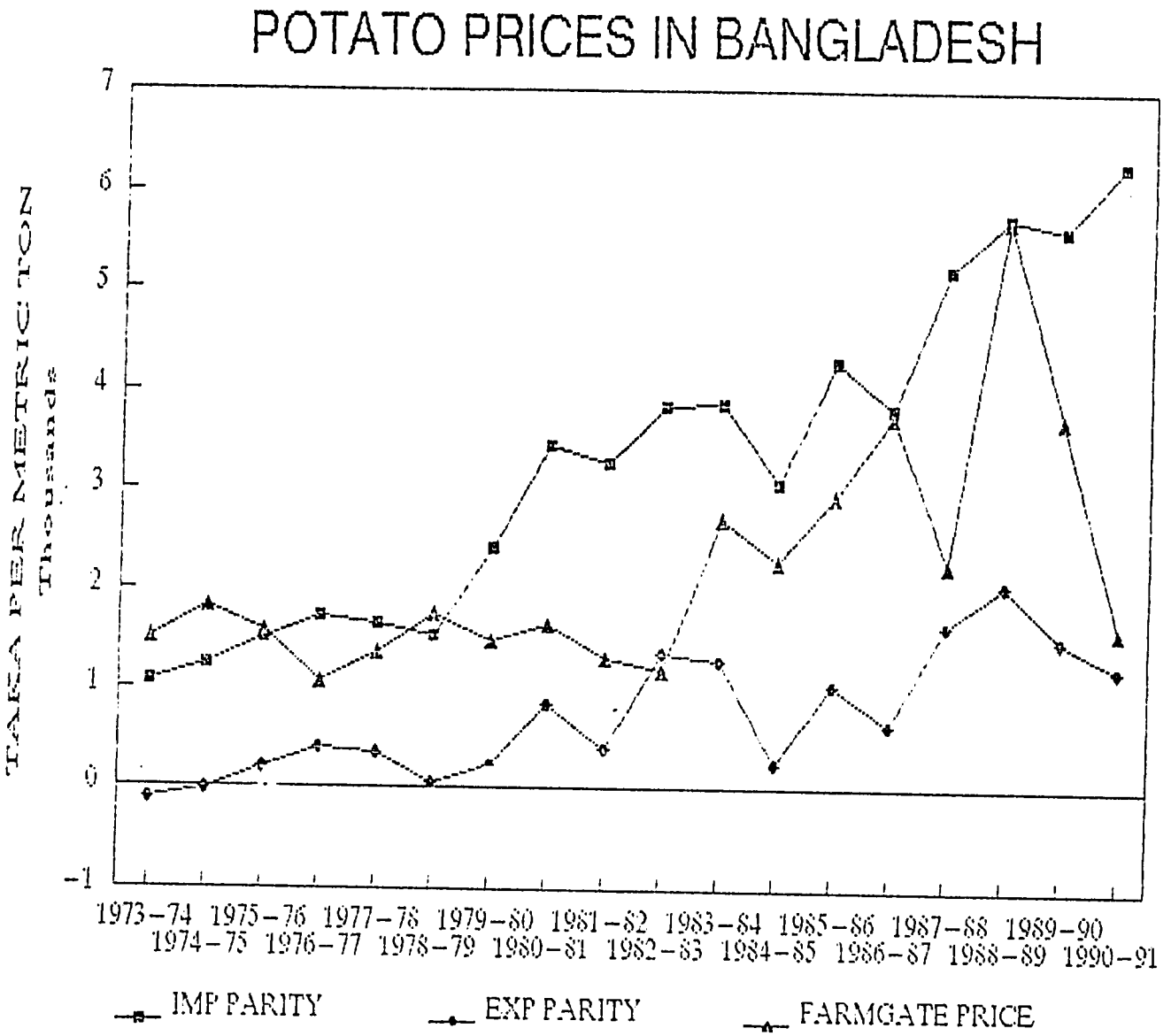


Figure 5.9

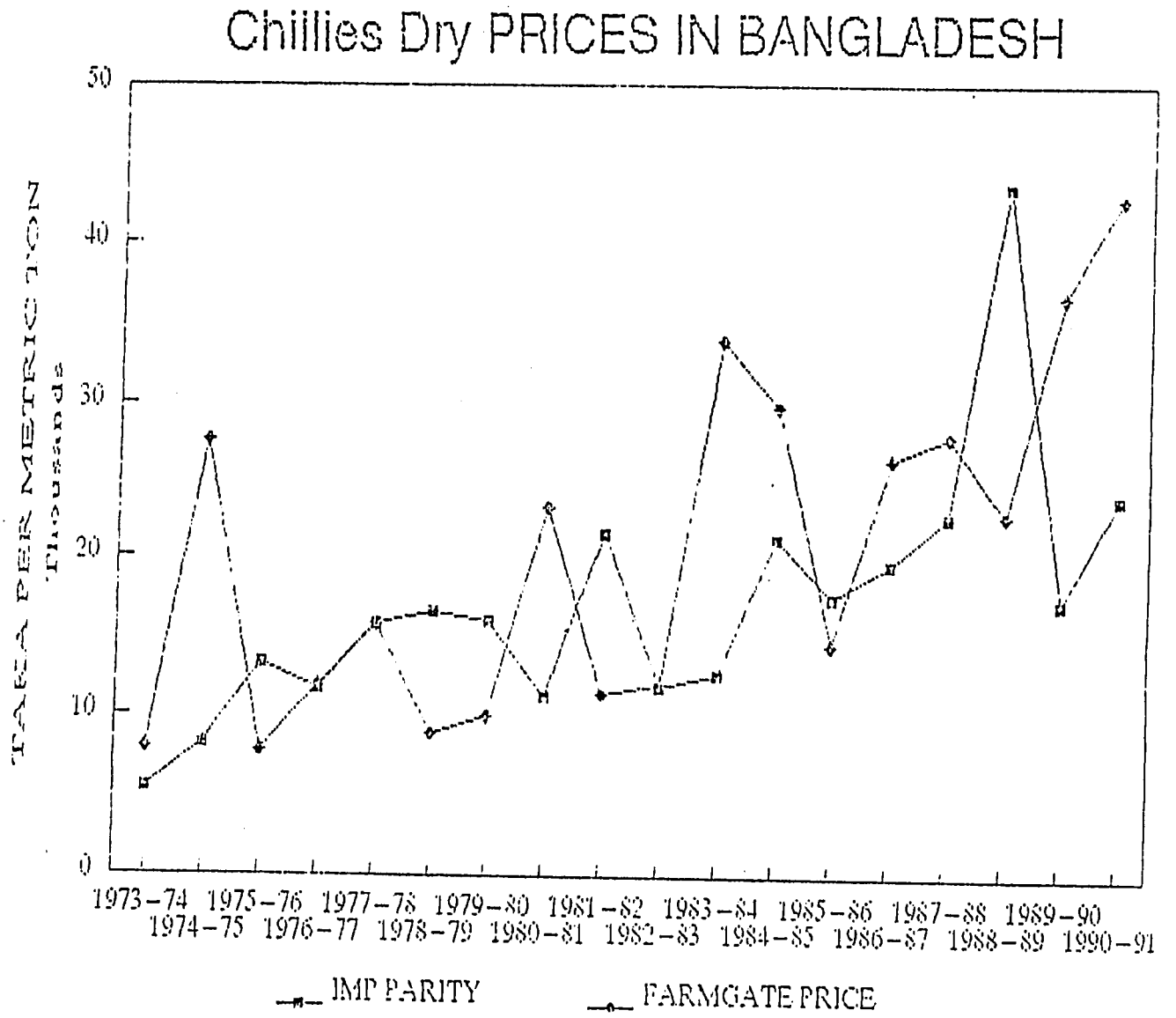


in this commodity. Except for the period 1973/74-1975/76 and 1978/79 when both the import and export parity prices were below domestic producer prices, the latter has been between the two border parity prices. In calculating protection rates, the average of the import and export parity prices was used as the reference price under free trade. The results indicate that potato production was highly protected in the early years which declined over time becoming negative in the 1980s. In the period 1986/87-1990/91, direct nominal protection was 8% on average. Including the indirect effects of economywide exchange rate and commercial policies yields an average total nominal protection rate of -22% in the same period, implying that real domestic producer price of potato was only 78% of its free trade equilibrium real price. There appears to be some informal imports particularly, during the lean season from neighboring India. However, with increasing domestic cold storage facilities, off-season informal trade appears to have declined. Some potato exports have also been recorded in the second-half of the 1980s.

5.2.8 Chilies

Dry red chilies have been imported into Bangladesh from India in periods of scarcity. The price of imported chilies was less in six out of ten years in the 1980s. Dry red chilies have enjoyed positive nominal protection in 11 out of the 18 years considered in this study. In the most recent five-year period ending in 1990/91 the direct nominal protection rate dry red chilies was 37%. However, the indirect effects of real exchange rate appreciation reduced the

Figure 5.10



nominal protection rate to 28%. Thus, domestic producer prices of chilies were 28% higher than they would have been under free trade in dry red chilies with a free-trade equilibrium exchange rate.

5.2.9 Onions

Onions have also been imported from India in certain years. In 11 out of 18 years considered in the study producer prices have exceeded the import parity price. Nominal protection to onion has been ranging from 2% to 5% between 1976/77 and 1990/91. The nominal rate of protection was around 2% only from 1986/87-1990/91. But, total protection including the effects of real exchange rate appreciation yields a total the nominal protection rate to -6.2%.

Exportables

5.2.10 Jute

Jute has lost the central position it occupied in Bangladesh' exports with the emergence of readymade garments in the early 1980s. It, is still however, an important export commodity and the most important among agricultural exports. Jute fiber or raw jute is internationally traded. Bangladesh is the predominant raw jute supplier in the world market. The price of jute fiber ex-Bangladesh ports is thus, considered as the world price.

Figure 5.11

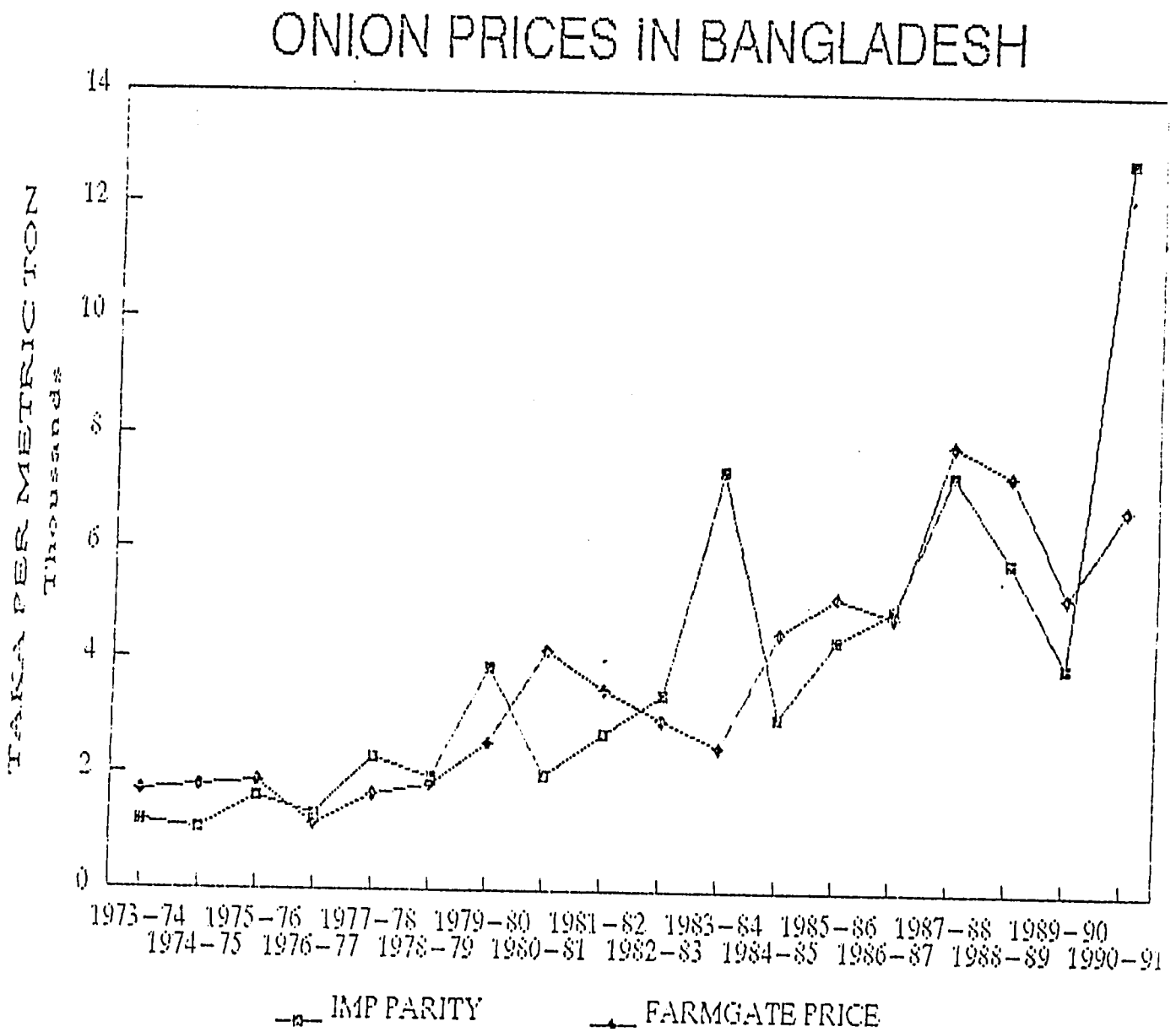
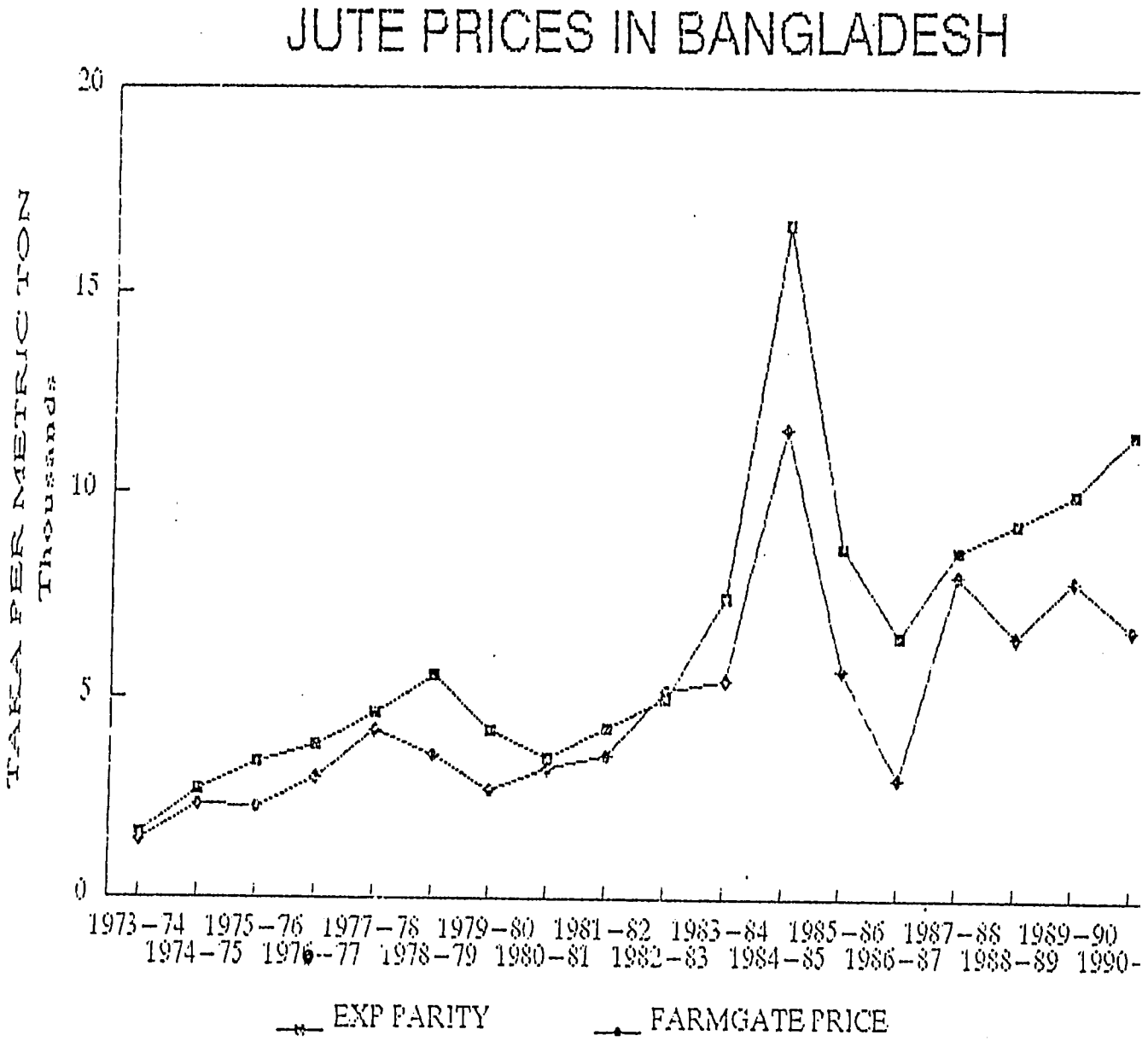


Figure 5.12



The direct effect of jute pricing and trade policies have resulted in negative nominal protection. Thus, domestic producer prices have always been below the world border price at farmgate at the official exchange rate. A large increase in the export tax on raw jute in 1975/76 following a 60% devaluation of the exchange rate depressed the domestic price of raw jute to 64% of its border parity price at farmgate at the official exchange rate in that year. Similarly, a ban on raw jute exports towards the end of the 1984/85 season depressed domestic prices to 70% of the world price measured at farmgate. On average, domestic raw jute prices ranged from 81% to 85% of the export parity price upto 1985/86 but then declined to an average of 72% of the world price at farmgate between 1986/87-1990/91. The implicit total taxation of raw jute measured at free trade equilibrium exchange rate was almost twice as much as the direct tax measured at the official exchange rate in the 1980s but declined to 40% from 1986/87-1990/91. Evaluated at free trade equilibrium exchange rate the average domestic producer's price of raw jute was only 59% of the export parity price at farmgate in 1973/74-1975/76 and since then, has been approximately 64% of the export parity price on average, at free trade equilibrium real exchange rates. Thus, real exchange rate appreciation increased the implicit tax on raw jute exports very significantly.

5.2.11 Tea

The direct effect of trade and policies have been adverse for tea, an important export commodity of Bangladesh. The domestic producer price of tea

has been below the export parity farmgate price whether evaluated at the official or equilibrium exchange rate in all but five years, thus the nominal rate of protection has always been negative except in these five years. On average domestic tea prices were 81% of its border parity price at farmgate from 1981/82-1985/86 but, increased to 85% of the export parity price between 1986/87-1990/91. Including the indirect effects of real exchange rate appreciation increases the discrimination against tea exports. Producer prices were estimated to be 76% and 73% of the free trade equilibrium export parity price on average from 1981/82-1985/86 and from 1986/87-1990/91 respectively.

5.2.12 Horticultural Products

Vegetables and fruits are being exported from Bangladesh since the 1980s. These horticultural products cater to the demands of expatriate Bangladeshis living mainly in the U.K. and Arab middle-east. Vegetable and fruit exports increased greatly in the late 1980s. The potential for exports of horticultural commodities however, is constrained by the large domestic marketing margins between farmgate and export prices in Bangladesh. Marketing margins are typically 4-6 times the farmgate price reflecting great inefficiency in marketing of horticultural exports. Table 5.2 shows that direct trade policies discriminated against all horticultural exports of Bangladesh in 1990/91 and that implicit taxation of these export products increased significantly due to exchange rate policies. The direct effects of trade policies have caused the producer prices of horticultural exports to be very

Figure 5.13

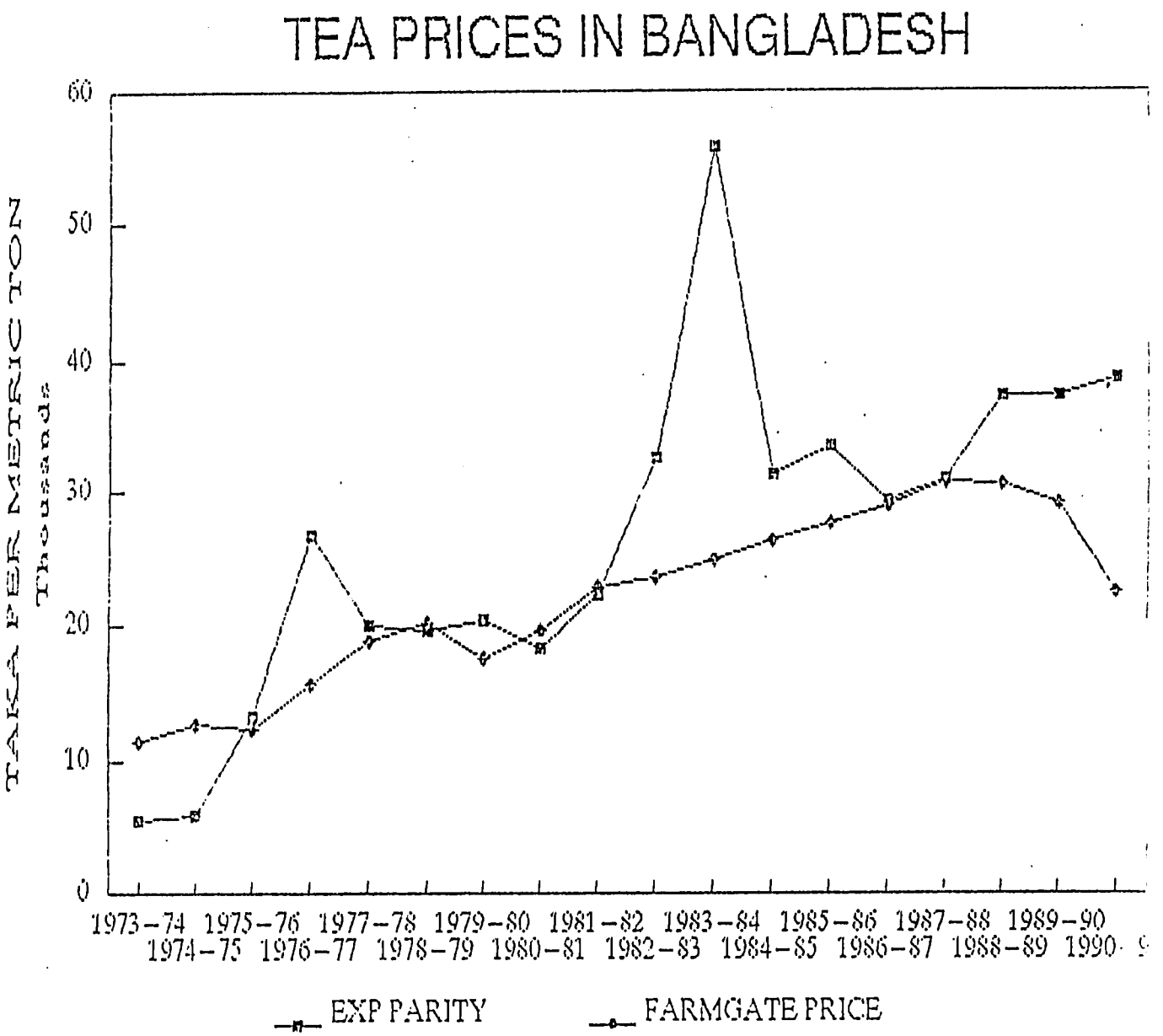


Table 5.2

Direct and Indirect Nominal Protection to Producers of Horticultural Products in 1990/91

Horticultural Commodities	Farmgate Price Tk/Kg	Export Price (f.o.b.Dhaka) Tk/Kg	NRP	NPR D	NPR T
Vegetables					
Cucumber	6.00	31.535	-0.714	-0.667	-0.733
Kakrol	6.00	31.535	-0.714	-0.666	-0.733
Green Papaya	3.00	31.535	-0.857	-0.800	-0.867
Green Chilies	12.00	31.535	-0.426	-0.398	-0.465
Olive	7.00	31.535	-0.666	-0.621	-0.688
Poi sak	4.00	31.535	-0.809	-0.755	-0.822
Long Yard bean	7.00	31.535	-0.667	-0.622	-0.689
Tamarind	5.00	31.535	-0.762	-0.711	-0.778
Green Banana	8.00	31.535	-0.620	-0.578	-0.645
Fruits					
Mango	20.00	49.380	-0.471	-0.444	-0.501
Litchi	12.00	49.380	-0.691	-0.653	-0.708
Banana	12.00	49.380	-0.691	-0.653	-0.708
Papaya	6.00	49.380	-0.846	-0.798	-0.854
Jambura	2.00	31.535	-0.905	-0.844	-0.911
Guava	4.00	31.535	-0.809	-0.755	-0.822
Amra	3.00	31.535	-0.857	-0.800	-0.867
Others					
Betel Leaves	42.00	67.225	-0.259	-0.246	-0.297
Dry Betelnuts	70.00	129.682	-0.412	-0.393	-0.440

Source: Own Calculations.

significantly below their free trade border prices. The modal implicit taxation rate was around 70% in 1990/91. In interpreting the results shown in Table 5.2, one important caveat should be borne in mind, i.e., that the large implicit taxation reflects rather large domestic marketing spreads between

farmgate and export prices in Bangladesh. The direct and nominal protection rates, therefore, mainly reflect great inefficiencies in the export marketing chain for horticultural products. Due to lack of price data prior to 1990/91 the analysis of direct and indirect effects of trade and exchange rate policies for horticultural commodities could only be conducted for 1990/91.

5.3 Effective Rates of Protection

Trade and exchange rate policies influence not only the prices of agricultural outputs but also the prices of tradable inputs used in agricultural production. Thus, in general the effective rate protection is the more relevant measure of incentives. While the direct effects of trade and exchange rate policies on output price are measured by the nominal rate of protection NRP discussed earlier, the direct effects on value-added per unit of output of a commodity (defined as gross output value minus cost of material inputs) are measured by the effective rate of protection (ERP). Thus,

$$ERP_i = (VA_i - VA_i')/VA_i' = VA/VA_i' - 1$$

where, ERP is the effective rate of protection, VA is value added at domestic prices, VA' is value added at world prices evaluated at the official exchange rate and i denotes commodity. Following the method stated in section 5.1, The total (direct and indirect effects - including exchange rate policy) is given by:

$$ERP\ T = [(VA_i/V_{na}) - (VA^*/VA^*_{na})]/(VA^*_i/VA^*_{na})$$
$$= [(VA_i/V_{na})/(VA^*_i/VA^*_{na})] - 1$$

where, V_{na} is the value-added in the non-agricultural sector and the asterisks indicate that value added is measured at border prices evaluated at the equilibrium exchange rate. Since, computing VA^*_{na} from VA_{na} is beyond the scope of this study, P_{na} and P^*_{na} are used as proxies. Input costs used to calculate value-added by crop are based on cost and returns survey undertake for this project (Zohir, 1993) for a single year, i.e., 1990/91. The time series of input costs assume constant yields and constant input-output relations. Time series on output prices for the pre-1990/91 period was obtained from Ahmed* . Time series of border prices of fertilizers were computed using World Bank data. Time series of prices of all other material inputs e.g. seed, pesticides, organic fertilizer for the pre-1990/91 period were based on time series cost data obtained from Ahmed* . Year to year changes in costs where assumed to reflect price changes.

VA' used in the calculation of direct effects was computed with fertilizer measured at border prices assuming free trade in agricultural inputs, but no change in exchange rates. For VA^* required in estimating total effects of policy on value-added, input costs were evaluated at equilibrium exchange rates.

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* Dr. Akhter U. Ahmed, Consumption Economist, The Bangladesh Food Policy Project, IFPRI, Dhaka.

Table 5.3 shows the direct and total effective rates of protection of agricultural commodities. The effective rates of protection are in general similar to the direct and total nominal rates of protection presented earlier. This is due to low traded input cost component of most of the commodities shown in the Table. The effect of real exchange rate depreciation, as in the case of NRPs, is to increase the effective protection when ERPs are negative and reduce the effective protection when the ERPS are positive.

5.4 Instability of Prices

Maintaining price stability in agricultural markets is often an important policy objective of governments. Trade, exchange rate and pricing policies are therefore, designed to insulate the domestic market from the price volatility of world commodity markets. In Bangladesh, food price stability and security has been the overriding price policy concern of the government. Since, rice is the predominant food crop, the focus of price stabilization has been on rice. Table 5.4 shows that the coefficient of variation of domestic relative rice price was significantly lower than the relative import parity price of rice and the relative import parity price measured at the equilibrium exchange rate. The relative rice price is the ratio of domestic farmgate price to the non-agricultural price index.

TABLE-5.3

Measures of Direct and Total Effective Protection (ERP) to Producers of Agricultural Commodities in Bangladesh

Crops	1973/74	1974/75	1975/76	1976/77	1977/78	1978/79	1979/80	1980/81	1981/82	1982/83	1983/84
Avg.Parity: Rice(Coarse)											
ERP	-0.16	1.37	0.03	-0.13	-0.33	0.09	-0.17	-0.31	0.16	0.04	0.32
ERP T	-0.47	0.81	-0.12	-0.25	-0.40	0.00	-0.32	-0.42	0.01	-0.15	0.02
Imp.Parity: Rice(Coarse)											
ERP	-0.30	0.85	-0.15	-0.26	-0.40	-0.06	-0.29	-0.41	-0.08	-0.13	0.07
ERP T	-0.53	0.46	-0.27	-0.35	-0.46	-0.13	-0.41	-0.50	-0.19	-0.28	-0.15
Exp.Parity: Rice(Coarse)											
ERP	-0.03	2.30	0.31	0.04	-0.23	0.30	-0.00	-0.17	0.63	0.30	0.71
ERP T	-0.38	1.39	0.09	-0.11	-0.32	0.18	-0.20	-0.32	0.36	0.03	0.27
Imp.Parity: Wheat											
ERP	0.55	2.51	-0.21	0.14	0.05	-0.17	-0.03	-0.11	-0.03	-0.02	-0.07
ERP T	0.01	1.66	-0.32	-0.01	-0.07	-0.24	-0.20	-0.25	-0.15	-0.19	-0.27
Imp.Parity: Masur											
ERP				-0.53	-0.27	-0.46	-0.50	-0.35	-0.25	-0.05	-0.23
ERP T				-0.59	-0.36	-0.50	-0.58	-0.45	-0.34	-0.22	-0.39
Imp.Parity: Rapeseed											
ERP	0.89	5.26	0.73	0.33	0.66	0.29	0.50	0.97	0.26	-0.12	0.49
ERP T	0.20	3.41	0.47	0.14	0.46	0.18	0.21	0.62	0.11	-0.26	0.15
Exp.Parity: Jute											
ERP	-0.06	-0.13	-0.32	-0.21	-0.11	-0.36	-0.35	-0.07	-0.17	-0.00	-0.28
ERP T	-0.41	-0.33	-0.42	-0.32	-0.21	-0.41	-0.47	-0.23	-0.29	-0.18	-0.44
Imp.Parity: Cotton											
ERP	-0.80	-0.62	-0.84	-0.82	-0.82	-0.84	-0.89	-0.83	-0.84	-0.73	-0.74
ERP T	-0.87	-0.70	-0.86	-0.84	-0.84	-0.85	-0.91	-0.86	-0.86	-0.78	-0.79
Imp.Parity: Chili											
ERP	1.03	4.00	-0.43	0.03	0.05	-0.50	-0.41	1.95	-0.55	0.11	2.36
ERP T	0.36	2.80	-0.50	-0.05	-0.06	-0.54	-0.52	1.40	-0.61	-0.12	1.98
Imp.Parity: Onion											
ERP	0.46	0.92	0.19	-0.14	-0.28	-0.07	-0.35	1.26	0.33	-0.14	-0.66
ERP T	0.02	0.56	0.05	-0.24	-0.35	-0.14	-0.46	0.92	0.19	-0.27	-0.74
Avg.Parity: Potato											
ERP	3.02	3.19	1.14	0.05	0.43	1.36	0.26	-0.21	-0.29	-0.64	0.39
ERP T	1.26	1.80	0.71	-0.11	0.28	1.07	-0.02	-0.35	-0.39	-0.74	-0.17
Imp.Parity: Sugarcane											
ERP	-0.67	0.61	0.39	1.30	3.30	2.27	-0.47	0.26	5.66	4.37	-5.39
ERP T	-0.78	0.36	0.17	1.13	2.11	1.85	-0.59	-0.05	2.78	1.55	-11.45

Note : Rice (15% Broken).

Table-5.3 (Continued)

Crops	1984/85	1985/86	1986/87	1987/88	1988/89	1989/90	1990/91	Avg. 1973/74 to 1975/76	Avg. 1976/77 to 1980/81	Avg. 1981/82 to 1985/86	Avg. 1986/87 to 1990/91
Avg.Parity: Rice(Coarse)											
ERP	0.44	0.56	0.55	-0.08	0.04	0.14	-0.08	0.41	-0.17	0.31	0.11
ERP T	0.24	0.37	0.38	-0.19	-0.05	-0.01	-0.13	0.07	-0.28	0.10	-0.00
Imp.Parity: Rice(Coarse)											
ERP	0.10	0.17	0.20	-0.24	-0.14	-0.09	-0.26	0.13	-0.28	0.03	-0.10
ERP T	-0.03	0.04	0.09	-0.32	-0.21	-0.20	-0.29	-0.11	-0.37	-0.12	-0.19
Exp.Parity: Rice(Coarse)											
ERP	1.07	1.40	1.18	0.16	0.32	0.54	0.21	0.86	-0.01	0.62	0.48
ERP T	0.71	0.93	0.87	-0.01	0.17	0.32	0.13	0.36	-0.16	0.27	0.30
Imp.Parity: Wheat											
ERP	0.04	0.15	0.38	0.01	-0.07	0.22	0.22	0.35	-0.02	0.01	0.15
ERP T	-0.09	0.02	0.24	-0.11	-0.15	0.07	0.16	0.45	-0.15	-0.14	0.04
Imp.Parity: Masur											
ERP	-0.58	-0.16	0.01	0.13	0.05	-0.17	-0.44		-0.42	-0.26	-0.09
ERP T	-0.62	-0.25	-0.09	-0.00	-0.05	-0.27	-0.47		-0.50	-0.37	-0.18
Imp.Parity: Rapeseed											
ERP	0.49	0.86	2.35	0.75	1.22	1.35	1.38	2.30	0.55	0.40	1.41
ERP T	0.29	0.61	1.90	0.52	0.99	1.03	1.21	1.36	0.32	0.18	1.13
Exp.Parity: Jute											
ERP	-0.32	-0.35	-0.51	-0.11	-0.29	-0.22	-0.40	-0.17	-0.22	-0.22	-0.31
ERP T	-0.41	-0.42	-0.56	-0.22	-0.36	-0.32	-0.43	-0.39	-0.33	-0.35	-0.38
Imp.Parity: Cotton											
ERP	-0.67	0.50	0.11	0.30	0.11	0.05	-0.24	-0.75	-0.84	-0.49	0.05
ERP T	-0.71	0.31	-0.00	0.13	-0.00	-0.09	-0.28	-0.91	-0.86	-0.57	-0.05
Imp.Parity: Chili											
ERP	0.58	-0.23	0.55	0.33	-0.53	1.77	0.58	1.55	0.23	0.58	0.54
ERP T	0.35	-0.33	0.35	0.15	-0.58	1.56	0.48	0.89	0.05	0.26	0.39
Imp.Parity: Onion											
ERP	0.55	0.19	-0.02	0.07	0.28	0.34	-0.30	0.53	0.08	0.05	0.07
ERP T	0.37	0.07	-0.10	-0.04	0.17	0.19	-0.33	0.21	-0.05	-0.08	-0.02
Avg.Parity: Potato											
ERP	0.55	0.14	0.82	-0.38	0.50	0.06	-0.64	2.45	0.45	-0.03	0.07
ERP T	0.29	-0.02	0.58	-0.46	0.35	-0.08	-0.66	1.31	0.23	-0.20	-0.06
Imp.Parity: Sugarcane											
ERP	-3.59	-10.66	-10.14	4.31	1.78	3.83	-23.01	0.11	1.45	-1.86	-4.65
ERP T	-3.98	-36.47	-30.77	2.13	1.12	2.64	-291.45	-0.19	0.85	-9.50	-61.27

Source: Own Calculations.

Note : Rice (15% Broken).

Table 5.4

Coefficient of Variation and Average of Real Producer Prices in Bangladesh 1974-1991

	Coefficient of Variation			Mean		
	p/pna	p'/pna	p^*/pna*	p/pna	p'/pna	p^*/pna*
Rice 15% (Import Parity)	0.22	0.28	0.33	5052.88	5976.88	7025.72
Wheat (Import Parity)	0.30	0.18	0.22	5258.14	5013.58	5872.40
Rapeseed Oil (Import Parity)	0.33	0.21	0.26	43529.75	23096.66	25930.11
Rapeseed (Import Parity)	0.32	0.31	0.34	12276.13	7839.21	9357.05
Sugar (Import Parity)	0.18	0.49	0.58	18345.73	9654.19	11331.34
Chilies Red (Import Parity)	0.52	0.37	0.35	28535.88	24194.8ᵢ	28036.36
Onion (Import Parity)	0.23	0.37	0.38	4756.71	4817.46	5528.48
Cotton (Import Parity)	0.68	0.25	0.25	6742.07	14964.88	17547.55
Lentil (Import Parity)	0.15	0.22	0.22	9029.73	12825.22	14644.33
Potato (Import Parity)	0.38	0.15	0.17	3110.28	4222.92	4889.08
Jute (Export Parity)	0.36	0.36	0.34	6415.27	8898.35	10513.78
Tea (Export Parity)	0.27	0.40	0.40	31667.53	36929.03	43586.08

Source: Own Calculations. Border prices and non-agricultural price index are our own. Farmgate prices are from BBS Statistical Yearbook (various years) except for 1990/91 for which data were obtained from our market survey.

Note: P/P_{na} is the actual relative price received by producers. P'/P_{na} is the border price relative to an actual non-agricultural price index. P^*_p/P^*_{na} is the ratio of the border price of a farm product to the price of non-agricultural products with both prices evaluated at the equilibrium exchange rate.

Relative Price variability was also much lower for sugar compared to their border price equivalent both at the official and equilibrium exchange rates. In case of pulses (lentils) also, there is indication that the trade policy regime was able to insulate the domestic market from the price instability of the world market. In case of jute fiber and rape seed domestic and international price variability are not significantly different while, for cotton, potato, rape seed oil, and wheat the variability of domestic relative prices are significantly higher than their corresponding border price equivalents.

The analysis of price variability shows that agricultural trade and price policies have resulted in greater price stability for producers of rice, sugar, and lentils. While, the reduction of real price instability was accompanied by a higher average price for sugar. The average price for rice and lentils, however declined. As stated earlier, in case of both rice and sugar, the government has historically used direct interventions such as rationing, stocks management and price support in addition to trade restrictions, etc. to stabilize prices. For wheat, edible (rapeseed) oil, cotton, and potato, trade and price policies have resulted in greater producer price instability accompanied by a decline in average real price of wheat, cotton, and potato but an increase in the average real price of edible oil.

Section Six

Conclusions

High protection accorded to the industrial sector in Bangladesh resulted in significant real exchange rate appreciation. The concern regarding real exchange rate appreciation has traditionally focussed on erosion of export competitiveness. This study however, shows that the concern must extend to implicit taxation of the agriculture sector. Thus, the indirect effects of exchange rate policies have been a major determinant of price incentives in the agriculture sector. Though, an adjustable peg exchange rate policy was adopted since 1979, high nominal protection and pervasive quantitative restrictions on industrial imports caused the real exchange rate to appreciate.

The indirect effects of exchange rate policies consistently lowered the protection to agricultural commodities. Appreciation of the exchange rate offset the protection provided by direct trade policies for wheat, cotton, and potato and increased the implicit taxation of rice (when the import parity price is considered as the reference price), lentils, jute, and tea. For all other crops nominal protection was reduced due to appreciation of the real exchange rate in the second quinquennium of the 1980s.

Rice has been implicitly taxed throughout the 18 years considered in the study when the import parity price is taken as the reference price. Even when the average parity price is used implicit taxation of rice is evident except in the first half of the 1980s. However, in the latter case implicit taxation was only 2-5% from 1956/57 to 1990/91 while, it was only 3-5% from 1981/82 - 1985/86. In other words, the domestic rice price was close to its free trade equilibrium price when the average parity price considered as the international reference price. Implicit protection to wheat was positive upto the mid-1970s. However, between 1976/77 - 1985/86 wheat was implicitly taxed. The combined effects of trade and exchange rate policies on wheat was neutral from 1986/87 - 1990/91.

Oilseed and vegetable oil production has been excessively protected. On average, the domestic oilseed and vegetable prices were 76% and 46% above the world prices evaluated at the equilibrium exchange rate in the 18-year period from 1973/74 - 1990/91. Sugar and sugarcane have also enjoyed very high implicit protection. However, producers of cotton, lentils and the major export crops viz., jute and tea were implicitly taxed.

Direct Government policies also provided benefits through price stability. Domestic prices of rice, sugar, and lentils were significantly more stable than the respective world prices evaluated at free-trade equilibrium exchange rates.

The implicit protection rate of the agriculture sector as a whole averaged -18.1% from 1986/87-1990/91. With an aggregate agricultural supply response of 0.05 (Rahman and Yunus, 1993), the implicit taxation implies an average transfer of resources out of agriculture due to direct and indirect price and trade policies of Tk. 34926 million from 1986/87-1989/90 which amounts to 19.9% of average agricultural value added in the same period. This transfer, however, must be weighed against the transfers into agriculture through subsidies e.g., input subsidies etc.

Appendix 1

Supplementary Table-A1.1

Equilibrium Nominal and Real Exchange Rates

Year	OER	EQNER	RER	EQRER
1973-74	7.966	11.105	16.510	23.015
1974-75	8.875	10.701	16.128	19.446
1975-76	15.054	17.032	27.537	31.155
1976-77	15.426	17.292	29.214	32.748
1977-78	15.117	16.592	30.493	33.469
1978-79	15.223	16.359	30.801	33.100
1979-80	15.490	18.469	32.018	38.175
1980-81	16.259	18.977	29.891	34.889
1981-82	20.065	22.608	31.247	35.207
1982-83	23.795	28.147	33.480	39.603
1983-84	24.944	30.508	31.136	38.082
1984-85	25.963	28.907	28.176	31.371
1985-86	29.886	33.413	29.886	33.413
1986-87	30.629	33.964	30.358	33.663
1987-88	31.242	35.318	30.118	34.048
1988-89	32.142	35.358	28.822	31.705
1989-90	32.921	34.918	28.673	30.412
1990-91	35.690	37.677	28.919	30.529

Source: Own Calculations.

Appendix 2

Methodology for Calculating Border Parity Prices

Rice (Import Parity)

World price is c.n.f. Chittagong equals f.o.b. Bangkok plus freight from Bangkok to Chittagong.

- Average of f.o.b. Bangkok prices of 5% broken parboiled and 25% broken is used to represent the c.i.f. price of 15% broken Thai rice.

- Freight Rates: Freight rate from Bangkok to Dhaka (obtained from shipping agents) for 1990-91 is used. The time series was generated using an index of freight rates calculated from ocean freight rates for wheat (see below). International freight rates for individual agricultural commodities are not available. The wheat freight rate index is, therefore, used as a proxy for freight rates of all commodities considered in the study, except otherwise stated.

Border price measured at farmgate: World price times official exchange rate plus import handling, transport and domestic trading cost less cost from millgate to whole sale is equal to border price at millgate. From this, milling cost is subtracted and adjusted by the milling rate. Interest cost for 3 months and the cost from millgate to farmgate is then subtracted to yield border price at farmgate.

- Official exchange rate
- Milling costs is estimated to be 200.88 Tk/MT in 1990-91.
- Milling rate is 67% or .666.
- Interest adjustment for 3 months is used, i.e., time lag between harvest and import is assumed to be 3 months.
- Costs from millgate to wholesale is estimated as 596.54 Tk/MT for 1990-91.
- Costs from farmgate to millgate is estimated at 559.88 Tk/MT in 1990-91.
- Domestic farmgate price is price of coarse rice, i.e., HYV *boro*.

Estimates of all costs and marketing margins were obtained from a marketing survey of indenters, importers, domestic traders, millers, wholesalers, suppliers and other market intermediaries and farmers. For details see Rahman (1992d). For all commodities international freight cost and domestic marketing margins were obtained for 1990-91 and the parity prices were first computed for this year. The international and domestic transport cost and trading cost were extended backwards in time upto 1973-74 by using an international freight rate index, a domestic transport cost index and the CPI. The international freight index based on ocean freights for wheat was computed from IWC data. While, the domestic transport cost index and CPI were obtained from BBS Yearbook (various issues). International prices (f.o.b.), exchange rates,

wholesale prices and farmgate prices were available directly for each year. All domestic prices are taken from BBS Statistical Yearbook, various issues. The official exchange rate is the nominal average exchange rate published by the Bangladesh Bank (Economic Trends - various issues).

Rice (Export Parity):

World price (f.o.b. Chittagong) equals f.o.b. Bangkok price minus the freight from Bangkok to Chittagong.

- f.o.b. Bangkok 15% broken.
- freight rate (same as in case of rice import parity).

Border price measured at farmgate equals world price times official exchange rate less export handling and transport cost less domestic trading costs less cost from millgate to wholesale. Milling costs are then subtracted and the conversion rate is applied. Then the costs from farmgate to millgate are subtracted to yield border price at farmgate.

- Export handling cost is estimated at 477.57 Tk/MT for 1990-91.

Wheat (Import Parity):

World price is c.n.f. Chittagong: equals f.o.b. U.S. Gulf Hard Winter No. 2, Ordinary Protein plus freight from U.S. Gulf to Chittagong. Direct freight rates to Chittagong for the years prior to 1987-88 are not available.

For this period, therefore, the freight rates from US Gulf ports to India's East Coast i.e. Calcutta is used as the freight to Chittagong port. In the years when freight rates from both US Gulf to India's East Coast and US Gulf to Chittagong were available, the divergence was negligible.

Freight rates were taken from FAO Food Outlook No. 1/2, 1992, February 1992 and FAO Trade Yearbook 1988. World price is taken from FAO Production Yearbook (various issues) and FAO Quarterly Bulletin of Statistics third quarter 1991.

Border price measured at farmgate equals world price times official nominal exchange rate plus import handling transport from Chittagong to Dhaka, domestic trading costs less costs from farmgate to wholesale market less interest cost for six months (to account for time differences).

- Import handling cost is estimated to be 658.88 Tk/MT in 1990/91 which includes license fee, insurance, port dues, bank commission L/C opening charges, unloading and loading cost, clearing agency commission, etc. Except port dues the import handling cost is approximately estimated at 3 per cent of C & F price.

- Transport cost from Chittagong to Dhaka by road is estimated at Tk. 715 Tk/MT in 1990/91.

- Domestic trading cost includes selling costs (labour, utilities, rent, storage, etc.) It is estimated to 75 Tk/MT for 1990/91.

- Cost from farmgate to wholesale is estimated to be 1108.55 Tk/MT in 1990-91.

- Interest adjustment: Interest costs for six months at an annual rate of 18% on the farmgate price assuming that the imported wheat would appear in the domestic wholesale market after six months of the harvest.

Lentils (Import Parity):

World price is c.n.f. Chittagong equals c.i.f. UK price of Turkish lentils less 1% of c.i.f. UK price yields c.n.f. UK price. Subtraction of freight from Turkey to UK gives f.o.b. price in Turkish ports. Adding freight from Turkey to Chittagong gives world price of Turkish lentils c.n.f. Chittagong port. World price is obtained from FAO statistics, op.cit.

Border price measured at millgate equals world price (c.i.f. Chittagong) times official exchange rate plus import handling, transport, domestic trucking less costs from millgate to wholesale. Then milling cost is subtracted and, after applying the conversion rate, costs from farmgate to wholesale and interest costs of six months are deducted to yield border price at farmgate. This gives border price at farmgate.

Turkish lentils are compared with domestic masur.

- Milling cost is 211.81 Tk/MT in 1990-91.
- Conversion rate is 0.857353.
- (0.857353 kg of Masur is extracted from 1 kg of Masur seed)
- Cost from millgate to wholesale is estimated at 56.27 Tk/MT in 1990-91.
- Cost from farmgate to millgate is estimate at 1563.64 Tk/MT in 1990- 91.

Potato (Import Parity):

World price is c.n.f. Chittagong equals f.o.b. USA plus freight from US Gulf to Chittagong.

- f.o.b. price USA is average producer prices.

Border price measured at farmgate equals world price times official exchange rate plus import handling, transport and domestic trading cost less costs from farmgate to wholesale less interest cost for 6 months.

- Import handling estimated for 1990-91 is Tk. 671.05/MT.
- Transport costs (same as wheat).
- Domestic trading cost is estimated at Tk. 80/MT in 1990-91.
- Interest adjustment for 6 months.
- Cost from farmgate to wholesale is estimated at 990 Tk/MT in 1990-91.

Source: World price FAO Production Yearbook (different issues) and FAO Quarterly Bulletin of Statistics.

Potato (Export Parity):

World price is f.o.b. Chittagong equals f.o.b. USA average producer less freight from USA to Chittagong.

- f.o.b. USA, average producer.

Border price measured at farmgate equals world price times official exchange rate less export handling, transport, domestic trading cost and costs from farmgate to wholesale.

- Export handling costs is estimated to be Tk. 330.50/MT in 1990-91.

Sugar (Import Parity):

World Price is c.n.f. Chittagong equals f.o.b. white sugar at Caribbean ports plus freight.

- f.o.b. Caribbean ports, white.

Border price measured at wholesale equals world price times official exchange rate plus import handling, transport and trading cost.

- Import handling cost is estimated at 733 Tk/MT in 1990-91.
- Trading cost is estimated at 80 Tk/MT in 1990-91.

Sugarcane (Import Parity):

World price of sugar c.i.f. Chittagong is same as sugar.

Border price measured at farmgate equals border price of sugar at wholesale less costs from millgate to wholesale less milling cost times the conversion rate less the cost from farmgate to millgate.

- Milling cost for 1990-91 is estimated 3934.10 Tk/MT.
- Milling rate is 8.66%.

All sugar mills are in the state-owned sector. Due to huge financial losses in these public sector mills' the estimated conversion cost could not be used. Discussions with Sugar Corporation officials, mill engineers and private traders yielded estimates of sugar milling costs that would prevail under competitive market conditions.

Rape Seed (Import Parity):

World price is c.n.f. Chittagong equals c.i.f. N.W. Europe Canadian origin less 1% for insurance cost plus the freight from European ports to Chittagong port.

- *c.n.f.* N.W. Europe Canadian origin (Canadian 40%).

Border price measured at farmgate equals world price of rape seed times official exchange rate plus import handling, transport cost, trading cost less cost from farmgate to wholesale.

- Import handling cost is estimated at 715.91 Tk/MT in 1990-91.
- Cost from farmgate to wholesale is estimated at 1704.25 Tk/MT in 1990-91.

Rape Seed Oil (Import Parity):

World price of rape seed oil is available only for a few years i.e., 1988-1991. The price series is extended backwards upto 1973/74 by using a simple soyabean price index. Since soyabean oil prices were available for all years. These, international prices of rape seed oil and soyabean oil are assumed to move identically in years for which rape seed oil prices were not

available. World price is c.n.f. Chittagong equals f.o.b. Rotterdam price of Dutch crude plus freight from N. European ports to Chittagong.

- Price of rape seed oil, Rotterdam f.o.b. Dutch crude ex-mill.
- Refining margin for 1990-91 is estimated to be Tk. 9725.98/MT.

Border price at wholesale equals world price times official exchange rate plus import handling, transport, trading cost, refining margin.

Jute (Export Parity):

World price is f.o.b. Chittagong or Chalna.

Border price measured at farmgate equals world price times official exchange rate less export handling, transport, trading cost and interest cost of four months.

- Export handling cost is estimated at 1001.67 Tk/MT in 1990-91.
- Trading cost is estimated at 1009.32 Tk/MT in 1990-91.

Cotton (Import Parity):

World price is c.n.f. Chittagong equals Cotton lint Liverpool c.i.f. sm 1-1/16 US Memphis less 1% of the price from European ports to Chittagong.

- Cotton lint Liverpool, c.i.f. sm 1-1/16 US Memphis.

Border price measured at farmgate equals world price times official exchange rate plus import handling, transport and trading costs yields the border price at millgate. Then ginning cost is deducted and multiplied by the conversion rate. The cost from farmgate to millgate and interest cost of 6 months is then deducted to obtain the border price at farmgate.

- Conversion rate is 0.32467 units.
  (0.32467 kg of lint Cotton is extracted from 1 kg of Seed Cotton)
- Milling cost is estimated to be 3864.78 Tk/MT in 1990-91.
- Cost from farmgate to millgate is estimated at 1272.31 Tk/MT in 1990-91.

Chilies Dry (Import Parity):

World price is c.n.f. Hili (Dinajpur): equals wholesale price of Dry Chilies in Patna plus the transport cost from Patna (Bihar, India) to Hili.

- Wholesale price of Dry Chilies in Patna[1].
- Transport cost from Patna to Hili is estimated at $ 13 in 1990-91.

Border price measured at farmgate equals world price times official exchange rate plus import handling, transport, trading cost less cost from farmgate to wholesale less interest cost for six months.

- Import handling is estimated at 863.10 Tk/MT in 1990-91.
- Transport cost from Hili (Dinajpur) to Dhaka is estimated at 1200 Tk/MT in 1990-91.
- Trading cost is estimated for 1990-91 to be Tk. 79/MT.
- Cost from farmgate to wholesale is estimated at Tk. 1505.51/MT in 1990-91.

Source:

1. World price Agricultural Situation in India (various issues).

Onion (Import Parity):

World price is c.n.f. Benapole (Jessore) equals wholesale price of Bombay quality onion in Calcutta (West Bengal, India) plus transport cost from Calcutta to Benapole.

- Wholesale price of Bombay quality onion in Calcutta[1].
- Transport cost from Calcutta to Benapole is estimated at $ 5 in 1990-91.

Border price measured at farmgate equals world price times official exchange rate plus import handling, transport, trading costs less costs from farmgate to wholesale less interest cost for six months.

- Transport cost from Benapole to Dhaka is estimated at 1200 Tk/MT in 1990-91.

Source:

1. World price - same as in case of chilies.

Tea (Export Parity)

London action prices are considered to be the world price. However, there is a large quality differential between Bangladeshi tea and internationally traded tea. Export prices received for bangladeshi tea was on average 70% of the London auction price in Chittagong, i.e., after adjustment for freight from London to Chittagong. Thus, the London auction price in Chittagong was marked down using .7 as the quality discount factor to yield the international reference price of tea in Chittagong.

Direct and indirect costs of exporters, i.e., export handling transport, storage, utility, packaging, etc. from Chittagong port to the tea gardens in Sylhet and interest costs of 2 months were then deducted to yield the export parity price at farmgate.

Horticultural Products (Export Parity):

World price is f.o.b. Dhaka equals price at Saudi Arabia less the air freight from Dhaka to Saudi Arabia.

- Price at Saudi Arabia[1].
- Air freight was 22 Tk/Kg in 1990-91[2].

Border price measured at farmgate equals world price times official exchange rate less cost from farmgate to the export point which also includes exporting costs[3].

Sources:

1. Price data collected from the exporters during interviews with them.
2. Air Freight rates is taken from the local air line offices.
3. For detail, see the Working Paper on marketing margins.

Table-A2.1

Different Rates Used in Calculation

Year	Exchange Rate	CPI	Transport Index	Ocean Freight Rates US$/mt		
				US Gulf	European Port	Bangkok
1973-74	7.97	0.29	0.37	46.46	38.14	27.97
1974-75	8.88	0.35	0.48	39.24	32.21	23.62
1975-76	15.05	0.36	0.54	21.76	17.86	13.10
1976-77	15.43	0.38	0.49	21.74	17.85	13.09
1977-78	15.12	0.40	0.50	21.73	17.84	13.08
1978-79	15.22	0.45	0.48	27.47	22.55	16.54
1979-80	15.49	0.51	0.56	45.04	36.98	27.12
1980-81	16.26	0.60	0.57	53.86	44.22	32.42
1981-82	20.07	0.67	0.64	46.42	38.11	27.95
1982-83	23.80	0.74	0.64	29.54	24.25	17.78
1983-84	24.94	0.81	0.74	30.00	24.63	18.06
1984-85	25.96	0.90	0.84	30.00	24.63	18.06
1985-86	29.89	1.00	1.00	30.00	24.63	18.06
1986-87	30.63	1.10	1.15	25.33	20.79	15.25
1987-88	31.24	1.20	1.26	25.75	21.14	15.50
1988-89	32.14	1.33	1.21	30.88	25.35	18.59
1989-90	32.92	1.45	1.28	31.99	26.26	19.26
1990-91	35.69	1.58	1.46	36.54	30.00	22.00

Sources:

1. Bangladesh Bank, Economic Trends, various issues.
2. BBS, Statistical Yearbook, various issues.
3. FAO, Food Outlook, various issues.
4. FAO, Trade Yearbook, various issues.

Appendix 3

Estimation of PNA, PNA' and PNA*

PNA is defined as :

$$PNA = W_1 PM_{na} + W_2 PX_{na} + (1-W_1-W_2) \cdot PNT$$

Where, PM_{na} and PX_{na} are price indices of non-agricultural imports and exports respectively, and PNT is the price index of non-agricultural non-tradables. Weights W_1(=0.075) and W_2(=0.032), the shares of non-agricultural importables and exportables in the non-agricultural value added, were estimated using 1985-86 data for GDP and value added. The non-agricultural export sector value added was the sum of the value added of the export substituting sector suggested by Sahota. The remainder of the value added in manufacturing was assigned to the non-agricultural import sector.

PM_{na} and PX_{na} are weighted averages of the domestic prices of non-agricultural import and export goods used in the construction of $(1+t_m)$ and $1-t_x$). The Consumer Price Index (CPI) is used as a proxy for the index of non-agricultural non-tradables (PNT).

PNA' and PNA* were constructed using estimates of world prices of imports (PM_{na} \$) and exports (PX_{na} \$) measured in dollars and Indexes of official and equilibrium nominal exchange rates (E and E^* respectively).

$$PNA' = W_1 . E . PM_{na}\ \$ + W_2 . E . PX_{na}\ \$ + (1-W_1-W_2)\ PNT$$

and $$PNA^* = W_1 . E^* . PM_{na}\ \$ + W_2 . E^*\ PX_{na} + (1-W_1-W_2) . PNT$$

Finally, PM_{na} \$ and PX_{na} \$ are calculated using PM \$ and PX \$ and PM_a \$ and PX_a \$ where PM_a \$ is calculated using dollar prices of raw cotton, wheat, rice and edible oil and PX_a \$ is calculated using dollar prices of jute. Then PM_{na} \$ and PX_{na} \$ are defined as.

$$PM_{na}\ \$ = (PM\ \$ - d_1 . PM_a\ \$)/(1-d_1),\ d_1 = 0.17$$

and $$PX_{na}\ \$ = (PX\ \$ - e,\ PX_a\ \$)/(1-e_1),\ e_1 = 0.15.$$

Table-A3.1

Indices of Non-Agricultural Prices

	PNA	PNA'	PNA*	PNA'/PNA	PNA*/PNA
1973-74	0.292	0.273	0.276	0.933	0.946
1974-75	0.351	0.335	0.337	0.956	0.961
1975-76	0.364	0.357	0.358	0.980	0.981
1976-77	0.381	0.373	0.373	0.980	0.981
1977-78	0.398	0.391	0.390	0.984	0.982
1978-79	0.453	0.453	0.451	0.999	0.995
1979-80	0.524	0.517	0.521	0.986	0.994
1980-81	0.604	0.599	0.601	0.990	0.995
1981-82	0.679	0.676	0.676	0.994	0.995
1982-83	0.752	0.743	0.748	0.988	0.994
1983-84	0.838	0.815	0.824	0.973	0.983
1984-85	0.910	0.896	0.896	0.985	0.984
1985-86	1.000	1.000	1.000	1.000	1.000
1986-87	1.080	1.095	1.094	1.014	1.013
1987-88	1.185	1.196	1.197	1.009	1.010
1988-89	1.302	1.318	1.316	1.012	1.010
1989-90	1.536	1.556	1.434	1.013	0.934
1990-91	1.551	1.577	1.568	1.017	1.011

Source: Own Calculations.

Appendix 4

Calculation of Effective Rates of Protection

Data on costs and returns of production of different agricultural crops was obtained from a survey of costs and returns undertaken in 1991 within the IFPRI-BIDS Agriculture Diversification Project - (Zohir, 1993). In constructing a time series of the costs of production, the physical input-output relationships of 1991, i.e., technology were assumed to remain constant. Thus, changes in costs of production reflect changes in input prices only.

Parity prices of all 3 types of chemical fertilizer used in Bangladesh viz. urea, TSP and MP were computed from their international prices for each year to generate the time series. For urea import parity prices were used until 1986/87 followed by export parity prices from 1987/88 to 1990/91. The method of computation of the parity prices is shown in Table A4.1. Domestic marketing margins used in the border price calculations were obtained from Mahmud and Rahman (1987) upto 1985/86. From 1986/87 to 1990/91 the margins were updated using the CPI.

In case of rice, time series of costs of seed, draft animal labour, organic fertilizers, other chemical fertilizers and pesticides from 1973/74-1987/88 were obtained from Ahmed (op. cit.). The input costs series were extended to 1990/91 using a nonagricultural wholesale price index. In case of other crops, time series of costs of these inputs were not available. Thus, for each year the cost of each of these inputs were expressed relative to 1990/91. The simple inputs costs index was assumed to reflect price changes of the inputs and hence, applied to the physical input quantities obtained from the 1991 IFPRI-BIDS Survey to yield costs of these inputs with constant technology of 1991. Seed costs were assumed to vary with the price of output.

Border prices at farmgate computations shown in Appendix 2 were used for all outputs. The 1990/91 value of by-products of each crop was extended backwards from 1990/91 using the agricultural price index.

Table-A4.1

Parity Price of Fertilizers at Official Exchange Rate for 1990/91

	Urea (import parity)	TSP	MP	Urea (export parity)
f.o.b. ($/MT)	164	141	101	164
Freight (Tk./MT)	30	37	37	30
BD C & F ($/MT)	194	178	137	134
Domestic Handling Cost (From Port to Wholesale) (TK/MT)	1903	1944	1944	743
Border Price Measured at Wholesale (TK/MT)	8809	8281	6835	4022
Domestic Handling Cost (From Wholesale To Farmgate) (TK/MT)	350	350	350	350
Border Price Measured at Farmgate (TK/MT)	9159	8631	7185	4372
Market Price at Farmgate (TK/MT)	5310	5750	4890	5310
Conversion Factor	1.72	1.50	1.47	0.82

Source:
1) "Estimation of Economic Prices of Selected Commodities For Use in FAP Planning Studies" by Q. Shahabuddin & K.M. Rahman for 1990-91.
2) WB: Price Prospects for major Agricultural Commodities 1990-2005 Volume II, Table A17, Pp-355, March 1991.
3) "Rice Market Intervention System: The Case of Bangladesh" By Akhlaqur Rahman and Wahiduddin Mahmud (1987), A study undertaken for ADB.
4) Statistical yearbook of Bangladesh (Several Editions).

Notes:

Same Procedure has been followed in the Calculation of Parity Prices of Fertilizer using Equilibrium Exchange Rate.

Urea: f.o.b N.W. Europe.
TSP: f.o.b. U.S. Gulf
MP : f.o.b. Vancouver

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